SOIL INVENTORY OF THE COOS BAY DISTRICT

By Martin A. Townsend, James A. Pomerening, and Byron R. Thomas
Soil Scientists, Bureau of Land Management

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This report contains guidelines for use by
Bureau of Land Management resource managers.

U. S. DEPARTMENT OF THE INTERIOR

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Coos Bay District

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Martin A. Townsend, James A. Pomerening and Byron R. Thomas[1]

I. INTRODUCTION

The inventory area is located in southwestern Oregon. It consists of large portions of Coos and Douglas Counties and a small part of Curry County (Figure 1). The total area of the inventory is about 455,000 acres. The extent of the Bureau of Land Management land in the inventory area is 326,000 acres or about 510 square miles. It is interspersed with private, State, and county lands mostly in the uplands. Large tracts of agricultural lands, private forested lands, and lands of the Elliot State Forest, Siuslaw National Forest, and Siskiyou National Forest have been excluded from the inventory. Access is provided by U.S. Highway 101 along the coast, State Highway 38 along the Umpqua River and State Highway 42 along the Middle Fork of the Coquille River.

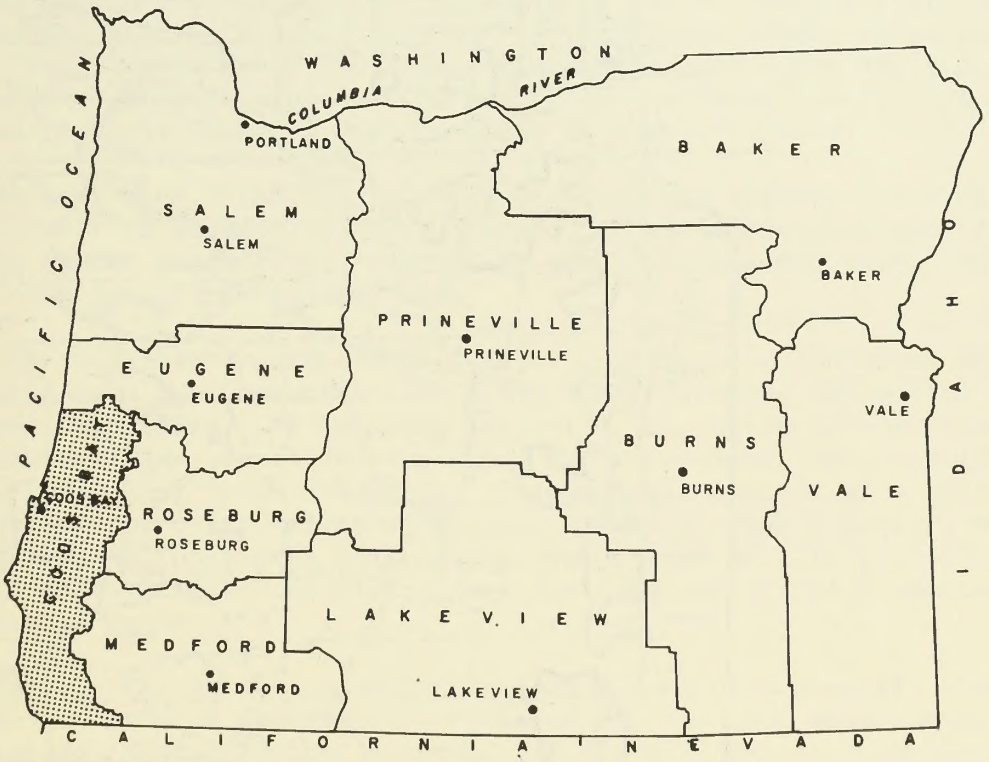

Figure 1. Location of the Coos Bay District soil inventory area.

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The locations of the three distinct parts of the inventory area--Northern, Southern and Curry County--are depicted in Figure 2.

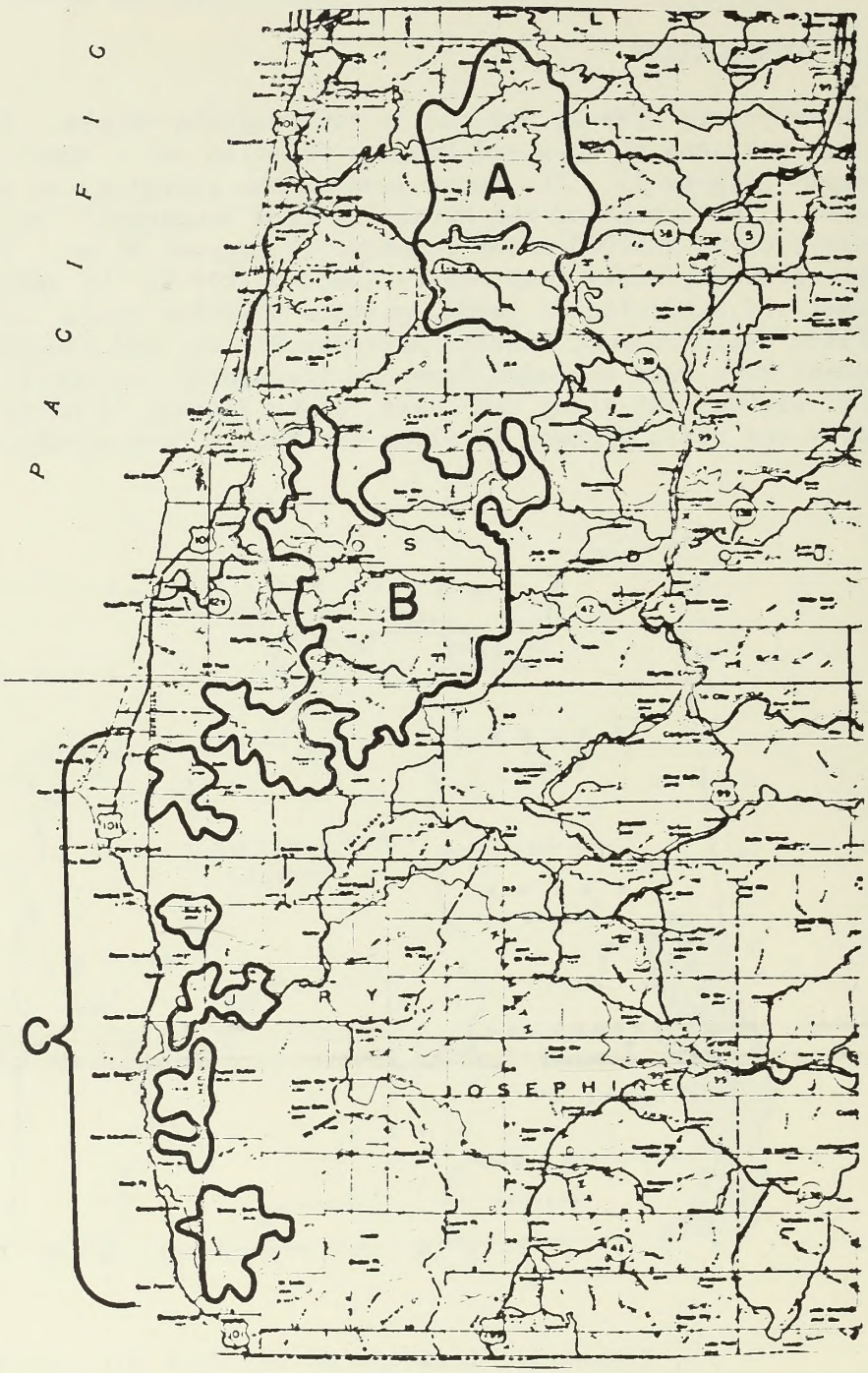

Figure 2. Location of the Northern (A), Southern (B), and Curry County (C) parts of the soil inventory area.

The northern part of the area is bordered on the west by the Siuslaw National Forest, on the north by the Lane County line, on the east by the Umpqua River and on the south by the Elliot State Forest and the Weyerhauser Company Millicoma Tree Farm. It includes a large portion of the Smith River Drainage and a minor portion of the Umpqua River Drainage. The length of the northern part of the area is about 30 miles, and the width is about 16 miles.

The Southern part of the area is bordered on the north by the Elliot State Forest and the Weyerhauser Company Millicoma Tree Farm, on the east by the Douglas County line, on the south by the Siskiyou National Forest, and on the west by mixed private lands. It includes a major portion of both the Coos River and Coquille River Drainages. The length of the southern part of the area is about 42 miles and the width is about 25 miles.

The Curry County portion of the area is bordered on the west by the Pacific Ocean, on the north by the Coos County line, on the east by the Siskiyou National Forest and on the south by the California State line. It includes small, scattered portions of the Floras Creek, Sixes River, Euchre Creek, Rogue River and Hunter Creek Drainages and a major portion of the Chetco River Drainage. The length of the Curry County part of the area is about 56 miles and the width is about 12 miles.

The inventory area primarily is a timber-producing region. Grazing and farming occur on adjacent private lands. The publicly-owned land is used for timber production, recreation, wildlife and watershed. Much of the private land is in timber, also.

The soils inventory report contains interpretations of technical and scientific data that are useful as a basis for planning and making land management decisions. It was made primarily to provide information about the soil and vegetation resources and to evaluate the potential and limitations of these resources. This report consists of a soil association map, descriptions of mapping units and soil behavior, detailed descriptions of individual soil series, and tables of interpretations for soil suitabilities and limitations for Coos Bay District resource management programs.

This soils inventory was conducted to locate soils and identify their response to resource management. For example, the soil association map and detailed interpretations and descriptions will assist foresters in timber-sale layout, cutting practices and harvest methods. It will help engineers in selecting sites for stable roads and will aid resource specialists in determining the suitability of sites for water reservoirs or for campgrounds. The general soil map and information about the climate, geology and land form of the area will be most useful for largescale planning of the entire area.

This inventory will also facilitate planning research on soils, vegetation, wildlife and watershed problem areas and will aid in applying the results of research to different parts of the District. Research results from any sample area can be extended with confidence to all other areas having the same combination of natural resources as the sample area. The report, in general, will add to the fund of knowledge about the environmental conditions on the District.

Three natural resources--soil, vegetation and water--are all interrelated and can be expected to last indefinitely if properly managed. Soil is renewable only over a long period of time and is the most critical resource. Proper management, therefore, involves using a very long-range planning period and having an understanding of the interactions among all resources. Ideally, proper management of the resources has the goal of maximizing economic returns without causing an adverse impact on any one of the resources or on environmental quality. Meeting this goal is difficult because of (1) the short-range view of many users, (2) the general lack of knowledge of the interactions among the resources and (3) differences in immediate economic returns among the various competing uses of the same resource.

All lands in the District are classified for multiple use and retention in Federal ownership unless otherwise withdrawn. Examples of withdrawn areas are the Cherry Creek Natural Area and the Lower Umpqua Scenic Corridor.

II. INVENTORY METHODS

This inventory was made in an area where a system of roads has been developed. Since little was known about the various soils in the Coos Bay District when the inventory was initiated, preliminary studies were needed. Therefore, traverse studies were made along prominent as well as little-used logging roads.

Traveling along the forest roads, soil scientists used the cutbank of road-ways to examine soil profiles. Soil profile characteristics were systematically recorded and notations were made of the shape and gradient of slopes, drainage dissection pattern of the watersheds, kinds and amounts of native vegetation and kinds and nature of the parent rock.

Representative sample areas were selected for each kind of mapping unit (map delineation) to determine the kinds of soils, their distribution, relative proportions and slope position. These sample areas were concentrated on BLM-administered lands. They were large enough to be representative and to disclose the pattern of soils in the mapping unit. Each sample area consisted of a two to five-mile section of road depending on the size of the delineations and the location of roads within them. Inspection of the soil profile and rock strata was made at one-tenth mile intervals along the roads. Identification of soils at these intervals, together with environmental features, served to provide the approximate percentage of individual soil series in the mapping units and the behavioral characteristics of each soil under different conditions. The soils were numbered or named and classified according to uniform procedures of the National Cooperative Soil Survey (USDA, 1951, 1960, 1975).

After a guide for identifying the soils and their interrelationships had been worked out, a soil map with a scale of 1:62,500 (1 inch: 1 mile), was compiled. The soil scientists drew the boundaries of the mapping units on 15 minute quadrangle topographic maps. The identification of the mapping unit boundaries was based on field examination of soil profiles and land forms in conjunction with the supplementary aids of stereoscopic examination of aerial photographs, geology maps, the contour patterns on the topographic base maps, mean annual precipitation maps, and plant community maps.

III. HOW TO USE THE REPORT

The mapping units for this inventory are phases of soil associations and miscellaneous land types. A soil association is a parcel of land that has a distinctive proportional pattern of two or more soil series that individually occur in areas too small to delineate separately. An association is named for the one, two or three most abundant soils making up collectively at least 80 percent of the area. Soils occupying less than 20 percent of the association are inclusions and, although not included in the name of the association, are described according to their setting and proportionate extent. It is important to recognize and identify these inclusions in the field because they may actually be the dominant soils of a management unit or timber harvest unit.

A soil series is comprised of soils with similar profiles. All soils of a series are similar in kind, thickness and arrangement of horizons and their structure, color, texture (except texture of the surface layer), and other important characteristics. In this inventory, each series is identified by a numeral, such as 10, 57, 501 or 580.

Soils identified by numbers from 500 to 599 were first located and described in the inventory area. Those soils identified by other numbers were first located and described elsewhere (Thomas et. al. 1969a, 1969b; Wert et. al. 1977).

Most soils have been correlated to named series commonly in use by the Soil Conservation Service. These names appear adjacent to identifying numerals in parentheses throughout the report.

Phases of soil series refer to differences in characteristics that are significant to the behavior and use of the soils. Slope gradient is the major characteristic used to define phases of soil series in this report. It is particularily important with respect to soil productivity, forest regeneration, and erosion and slope stability hazards.

The symbols 10-57/WX and 10-57/XW are two phases of the Blachly (10)-Preacher (57) association. Soils of the Blachly (10) series are the most abundant kind of soil in this association and are therefore listed first. Soils of Preacher (57) series are of secondary inportance but make up at least 20 percent of the area. Most delineations identified by the 10-57 designation will also have inclusions of soils from other series, such as Bohamon (63) and Digger (66). The W and X refer to slope gradient classes. Areas identified by a slope symbol of W are on slopes ranging from 10 to 35 percent. Those on slopes ranging from 35 to 60 percent are identified by an X. If the slopes mainly range from 10 to 60 percent, the combined symbol WX is used. If the symbol is WX, about 70 percent of the area has a slope gradient between 10 and 35 percent and 30 percent of the area has a slope gradient between 35 and 60 percent. If the symbol is XW, about 70 percent of the area has a slope gradient between 35 and 60 percent and 30 percent of the area has a slope gradient between 10 and 35 percent.

Some areas of land are so rocky, or so shallow that they scarcely can be called soils. Other areas of land occur along stream channels where small bodies of several kinds of soil are in a complex mixture. These areas are shown on the soil map like other mapping units but they are given the descriptive names of Rock land and Mixed Alluvial land and are called miscellaneous land types.

It is essential that the mapping unit descriptions be used for the determination of the location and extent of each soil in an association when the map is used. To find information about individual soils, refer to the report. Use the table of contents to locate the pages in the report that contain the table or descriptive material for the various kinds of information.

Persons using the report in the field should refer to the section on descriptions of soil series and mapping units. This will help them become acquainted with the characteristics and field relationships of individual soils to land form and slope positions.

If a person wants to know how a specific tract of land will behave under certain treatments or a silvicultural practice, he should:

First, locate the tract of land on the Soil Association Map. From this map, he learns the dominant slope group, aspect and soils of the association in which the tract is located.

Second, turn to the part of the report called Descriptions of the Soil Series, Soil Behavior and Mapping Units. Here, he is advised of the major as well as minor soils of each mapping unit, their physical and environmental features, their position and distribution on the terrain and their behavior under management. The same section shows the number of acres for each kind of delineation on the map.

Third, turn to the part called Soil Use and Management. Here, he can obtain additional information on applied uses of each soil in sections called (1) Engineering Uses of the Soils, (2) Interpretive Ratings for Soil Uses, (3) Interpretive Ratings for Selected Soil Properties and Qualities, (4) Forest Management, and (5) Wildlife Management.

Generally, the degree of limitation or capability for a specific objective is given for each mapping unit or soil series in tables. Definitions and criteria used to rate the soils are given in the report under the appropriate heading.

Persons interested in the general nature of the area, soil formation, and soil classification will find the general soil map and the specific sections of the report dealing with these matters of special interest.

IV. GENERAL CHARACTERISTICS OF THE AREA

A. Geology

The relationships between geologic materials and associated soils are shown in Table 1. Detailed and general studies of the geology of the District have been made by the Oregon Department of Geology and Mineral Industries (Baldwin, 1964, Baldwin, 1974, Baldwin and Beaulieu, 1973) and the University of Oregon, Department of Geology (Beaulieu, 1971, Dott, 1971, Beaulieu and Hughes, 1975). A stratigraphic chart for southwestern Oregon is shown in Figure 3 (Baldwin and Beaulieu, 1973).

The Coos Bay District can be subdivided into the two physiographic provinces that illustrate a varied geologic history: The Coast Range and the Klamath Mountains. The boundary between the two provinces follows roughly the course of the Middle Fork Coquille River. That portion of the Coast Range Province that is within the District and on BLM lands consists of the Tertiary, Eocene Roseburg (formerly Middle Umpqua), Lookinglass, Flournoy (formerly Upper Umpqua), Tyee, Elkton, Bateman (formerly Coaledo) and present Coaledo formations in ascending chronological order. These formations generally are composed of thick, rhythmically bedded sediments. Scattered volcanic materials also occur in the Roseburg formation. Pillow and brecciated submarine basalts are abundant locally in the Roseburg formation in the vicinity of Blue Ridge, Schneider Butte, Glen Aiken Creek and Sugar Loaf Mountain.

The pre-Tertiary strata of the Klamath Mountains are a major source of the sediments that filled early Cenozoic basins in southwest Oregon. Through the ages these sediments have been uplifted, folded and faulted. Faulting has usually taken place in a northeast-southwesterly direction.

During the Eocene Epoch of the Tertiary Period, a deep submarine trough or canyon occupied southwestern Oregon. It extended northward to Vancouver Island in British Columbia, was bounded on the east by the Cascade Range and on the south by the Klamath Mountains. To the west lay the open Pacific Ocean. Active erosion of the surrounding uplands, and down-warping of the basin produced thick sediments within the trough (Roseburg, Lookingglass and Flournoy formations). Sediments of these formations are micaceous conglomerate, sandstone, siltstone and shale. Sections of the Lookingglass formation are exposed along the Sandy Creek, Cherry Creek and East Fork Coquille River road cutbanks. Rocks of this formation are relatively incompetent. A nearly continuous section of the Flournoy formation is exposed along the south of Rock Creek near Remote and along a second Rock Creek tributary to Myrtle Creek south of Bone Mountain.

In Middle Eocene time a major downwarp of the submarine trough and uplift of the Klamath Mountains took place. Large quantities of sediment produced from rapid erosion of the Klamath Mountains were deposited within the trough in the form of deltas and submarine fans. Periodic

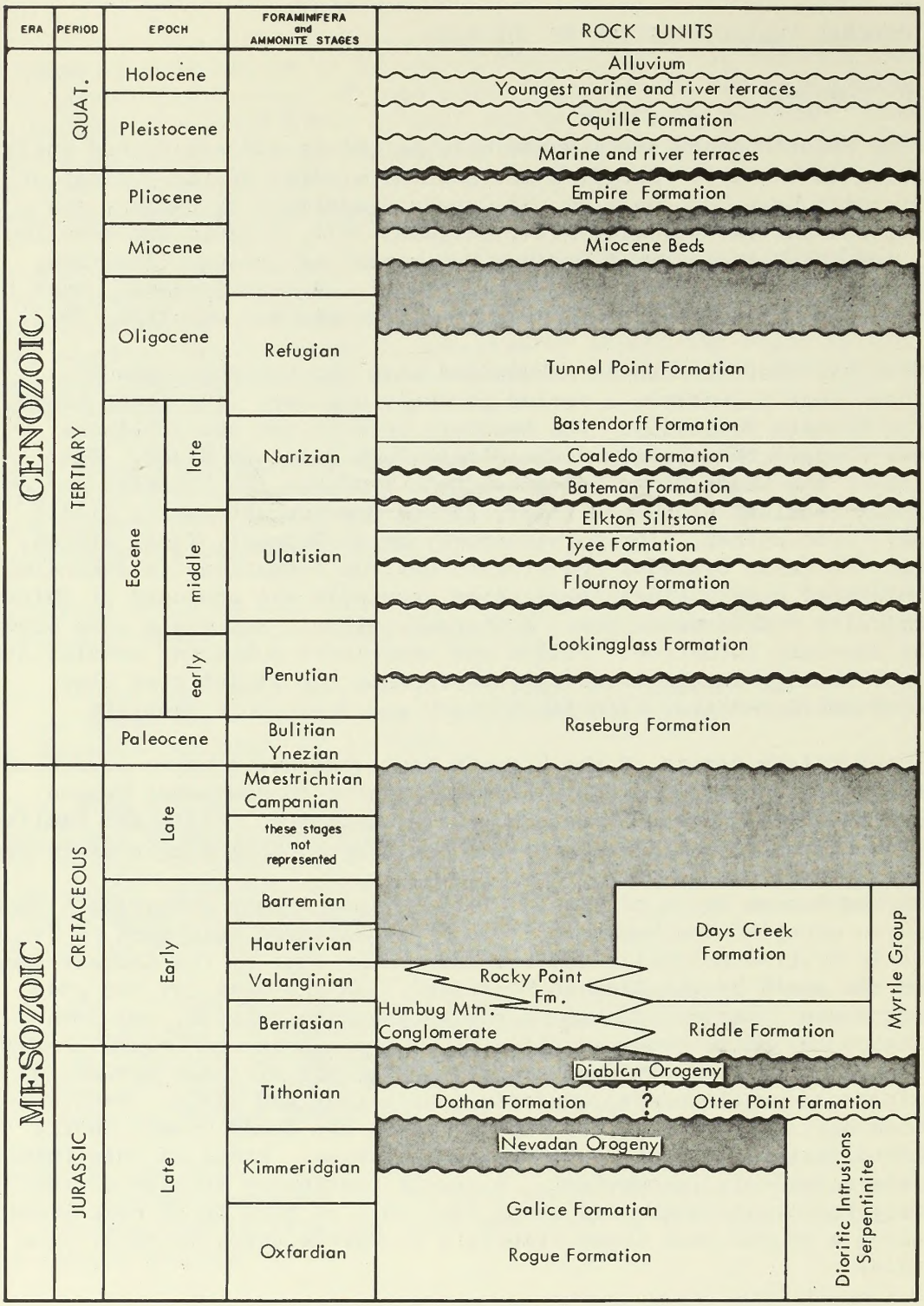

Figure 3. Stratigraphic chart for the southern Oregon coastal region. (After Baldwin and Beaulieu, 1973)

TABLE 1. GEOLOGIC MATERIALS AND ASSOCIATED SOILS

Type of Materials	Formation	Probable Age	Associated Soils and Miscellaneous Land Type
Ultramafic Complex (Peridotite and Serpentinite)	Unnamed	Late Jurassic	503
Sedimentary	Otter Point	Late Jurassic	Etelka (557), Whobrey (501) Digger (66), and Jason (64)
Metamorphic	Colebrooke Schist	Late Jurassic	505, Edson (580), Rockland (R)
Sedimentary	Dothan (Macklyn Member)	Late Jurassic	530, 524, Dement (540), Rockland (
Volcanics (Non-Ellipsoidal)	Dothan	Late Jurassic	520, 521, Rockland (R)
Sedimentary	Humbug Mountain Conglomerate	Early Cretaceous	Digger (66), Jason (64), Rockland (R)
Sedimentary and Scattered Volcanics	Roseburg	Tertiary (Early Eocene)	Honeygrove (14, Preacher (57), Blachly (10), Digger (66), Apt (50
Sedimentary	Lookingglass	Tertiary (Early to Middle Eocene)	Honeygrove (14), Preacher (57) Blachly (10), Bohannon (63), Jason (64), Digger (66)
Sedimentary	Flournoy	Tertiary (Middle Eocene)	Umpcoos (564), Jason (64), Blachly (10), Digger (66), Preacher (57), Bohannon (63), 166
Sedimentary	Tyee	Tertiary (Middle Eocene)	Umpcoos (564), Jason (64), Digger (66), Blachly (10), Preacher (57), Bohannon (63), Slickrock (54), Rockland (R), 166, Honeygrove (14)
Sedimentary	Elkton	Tertiary (Middle Eocene)	Apt (50),Preacher (57), Jory (12), Digger (66)
Sedimentary	Bateman	Tertiary (Late Eocene)	Preacher (57), Digger (66), Bohannon (63), Jason (64)
Sedimentary	Coaledo	Tertiary (Late Eocene)	Bohannon (63), Preacher (57), Digger (66), Honeygrove (14)
Alluvium	Unnamed	Recent (Holocene)	Mixed Alluvial Land

slumping of these large masses of sediments from the delta fronts created turbidity currents that transported sediment up to 150 miles northward. These sediments created the Tyee Formation which consists of rhythmically bedded arkosic sandstone, siltstone and shale rocks. These deposits buried pre-existing volcanic peaks on the sea floor with up to 10,000 feet of sediments. Exposures of the Tyee Formation form parts of Bone Mountain, Thomas Mountain, Brewster Rock, Ivers Peak, Coos Ridge and Kenyon Mountain. Eventually the entire trough became filled with sediments. Coal-bearing continental beds and near shore sands were laid down along the southern boundary of the trough. Silt and clay were deposited in the deeper waters.

During late Eocene time, further deformation produced broad regional uplifting of the volcanic materials and bedded sediments. Erosion materials from the Cascade Range were deposited in intervening marine depressions reaching a maximum thickness of 3,000 feet which formed the mudstone, siltstone and sandstone rock of the Coaledo Formation.

The Bateman Formation consists of approximately 1,500 feet of cross-bedded and current-sorted silty sandstone and siltstone marine sediments interstratified with coal-bearing beds in the center of a circular shallow basin surrounded by the Elkton Formation. Old Blue Lookout, Rainy Peak, Soup Mountain and Bateman lookout are outcroppings of this formation. Exposures along the Rader and Waggoner Creek Roads are representative of the Elkton Formation. Gentle uplift throughout this time created a broad coastal plain with estuaries and deltas. Plant debris accumulated and eventually formed coal beds. The combination of sediment and coal seams resulted in the Coaledo Formation that produced the Coos Bay Coal Field.

Mass movements including massive landslides, slumps, debris avalanches and related phenomena are widespread through much of the Coast Range and Klamath Mountains especially in areas of rapid downcutting and erosion. In some instances extensive failures have blocked large streams to form landslide lakes (i.e. Loon Lake and Ancient Lake Sitkum).

The Klamath Mt. Province is much older geologically than the Coast Range Province and has been subjected to many periods of uplift and cycles of erosion. That portion of the Klamath Mountain Province that is within the District and on BLM lands consists of the Late Jurassic ultramafic complex, the Late Jurassic sedimentary Otter Point Formation, the Late Jurassic sedimentary and volcanic rocks of the Dothan Formation, the Late Jurassic metamorphic Colebrooke Schist Formation (uncertain age) and the Early Cretaceous sedimentary Humbug Mountain Conglomerate Formation in ascending chronological order.

The Late Jurassic ultramafic complex consists primarily of periodotite and serpentinite. In the vicinity of Signal Buttes, Hunter Creek Bog, Red Flat and northwestward to the Rogue River, large masses of schist overlie and are locally mixed with serpentinite. This supports the

interpretation of some geologists (Dott, 1971) that the Late Jurassic Colebrooke Schist Formation was thrust into the area upon a "tectonic carpet" of serpentinite.

The ultramafic complex includes a group of rocks composed essentially of magnesium iron-silicate minerals. Geologic interpretations of the origin of these rocks are very complex and are beyond the scope of this investigation. Ultramafic rocks are usually dark-colored and fine-grained. The color of serpentinite ranges from yellow-green, bluish-green or olive-green to almost black. Serpentinite occurs also as an intrusion within non-ultramafic rocks in the form of thin slivers or extensive masses. The thin belts of serpentinite are frequently oriented southwest to northeast and often occur along fault zones.

The Late Jurassic Otter Point Formation consists of highly sheared, (See figure 4) tan, dark-gray or black sandstone with inter-stratified thin mudstone, minor conglomerate, chert and volcanic materials. The Otter Point Formation lies adjacent to the Colebrooke Schist Formation and is bounded almost everywhere by faults. It is assumed to be as much as 10,000 feet thick and contains tectonically emplaced pods of blue schist, serpentinite and chert. Geologists often refer to the Otter Point Formation as a melange, complex or assemblage rather than a true rock-stratigraphic unit. Exposures of this formation are common in the Floras Creek, Edson Creek, Baker Creek, Elk River, Indian Creek watersheds and west of the Ultramafic Complex between Brushy Bald Mountain and Whalehead along the Coast. Outcrops occur along the South Fork of the Coquille River drainage between Broadbent and Powers. This formation includes areas formerly assigned to the Riddle Formation and the Myrtle Group. Geologists consider much of the terrain that develops in the Otter Point Formation as classical earthflow and slump topography.

The Late Jurassic Colebrooke Schist Formation consists chiefly of gray to black, metamorphic quartz-mica phyllite and schist derived from thinly stratified mudstone, sandstone and fine conglomerate. It contains about 5 to 10 percent metavolcanic rocks and associated chert. Prominent exposures occur at White Mountain, Brushy Bald, Sawtooth Mountain, Lobster Hill and along the Rogue River north of Skookumhouse Butte.

The late Jurassic Dothan Formation consists of interbedded dark graywacke sandstone, mudstone and shale. Locally, pebble and cobble conglomerates, bedded cherts and volcanics occur. The Macklyn Member dominates on BLM lands in the District. It consists primarily of sandstone, mudstone and siltstone with appreciable volcanic rocks and some chert and conglomerate. Exposures of this formation are visible in cutbanks along the Chetco River Road, the Gardner Ridge Road and the Agnew Road which parallels the North Fork, Chetco River. Estimated thickness is 18,000 feet. Geologists consider the Dothan and the Franciscan Formation of California to be very similar in characteristics.

Figure 4. Bedrock exposure in Otter Point Formation. Note that bedding in the rock sediments is not clearly visible. The alteration of bedding planes was due to rock shear from faulting and folding.

The non-Ellipsoidal Volcanics Member of the Dothan Formation occurs in distinct belts between Gardner Ridge and Old Highway 101 in the vicinity of Colegrove Butte. It consists of lava, breccias and conglomerate rocks. Prominent exposures are visible at Palmer Butte, Bosely Butte and Morton Butte. The Early Cretaceous Humbug Mountain Conglomerate Formation is of minor extent on BLM lands. It occurs in scattered parcels but is prominently exposed at Mount Avery and Rocky Peak. The formation consists of mudstone and sandstone interstratified with conglomerate beds that average 2 to 3 feet thick but range up to 10 feet thick. The best exposure of this formation is on the southwest and northwest sides of Humbug Mountain (Dott, 1971).

B. Climate

The climate of the Coos Bay District is moist and temperate due to prevailing westerly winds and the proximity of the Pacific Ocean. Winters are generally cool and moist and summers are warm and dry with intermittent rains. Precipitation and temperature data are summarized in Table 2 (Johnsgard, 1963; Mann and Ferguson, 1911; Sternes, 1970; Beaulieu and Hughes, 1975). Rainfall varies along the coast from a low of 55 inches at Bandon to a high of 99 inches at Langlois. Rainfall ranges inland from a low of 50 inches at Elkton (elevation 150 feet) to a high of 100 inches at the crest of the Coast Range (elevation approximately 3,000 feet). Approximately 80 percent of the annual precipitation occurs from the months of October through March (Table 3). Winter rainfall may be steady for several days but frequently rainfall intensities may produce between 4 and 6 inches of precipitation during a 24 hour period. Strong southwesterly winds usually accompany these intense storms. They commonly are associated with landslides such as debris avalanches and slumps which produce debris and sediment in the streams. Summer precipitation usually is limited to occasional light rains.

Generally, the soils of the inventory area have a udic moisture regime (dry between depths of 4 and 12 inches for less than 45 consecutive days during the summer). But the Jory (12) series and some soils of Curry County (Units 505, 520, 521, and 530) have a xeric moisture regime (dry between depths of 4 and 12 inches for more than 45 consecutive days during the summer). A dry soil is one in which the soil moisture is held with tensions of 15 or more atmospheres, or the soil moisture content is below the permanent wilting point.

Relative humidity generally is above 65 percent during the months of October through March. Summer humidity usually is in the range of 35 to 45 percent. Occasional, short periods of strong easterly winds occur during the summer. During these periods the humidity will decrease to 10 to 20 percent, which presents an extreme forest fire condition. About 100 days of fog can be expected along the coast each year. This has a favorable impact upon the encroachment of brush in clearcuts located within the fog belt.

TABLE 2. ANNUAL TEMPERATURE AND PRECIPITATION VALUES

AT VARIOUS LOCATIONS IN THE COOS BAY DISTRICT

After Johnsgard (1963), Mann & Ferguson (1911), Sternes (1970), and Hughes (1975).

County	Station	Annual Temperature			Annual Precipitation
		Average	Avg. Min	Avg. Max.	Average
Douglas	Elkton	54.2	42.6	65.7	50.2
Douglas	Gardiner	52.2	45.4	59.8	78.1
Douglas	Reedsport	52.4	44.1	60.8	74.2
Coos	Bandon	51.6	43.2	59.9	55.5
Coos	Coquille	53.0	42.3	63.7	59.8
Coos	McKinley	52.6	41.0	64.1	64.4
Coos	Fairview	52.7	---	---	69.3
Coos	Marshfield	51.8	42.7	60.7	64.5
Coos	North Bend	52.4	45.1	60.0	62.3
Coos	Powers	53.7	41.7	65.7	61.6
Curry	Brookings	53.4	45.6	61.3	81.9
Curry	Gold Beach	52.7	45.5	60.0	81.6
Curry	Langlois	53.4	43.5	63.4	99.5
Curry	Port Orford	52.9	45.5	60.3	71.5

TABLE 3. MEAN MONTHLY PRECIPITATION AND TEMPERATURE

AT NORTH BEND CAAAP AND MCKINLEY STATION

After Johnsgard (1963)

Month	Mean Temperature °F	Mean Precipitation inches
	North Bend CAA AP Coos County, Oregon (1931-1955)	
January	45.2	9.9
February	46.5	8.0
March	47.6	7.6
April	50.0	4.1
May	53.5	2.7
June	56.8	1.8
July	59.1	0.4
August	59.6	0.6
September	58.2	1.7
October	55.1	5.4
November	50.3	9.0
December	47.0	11.1
	MCKINLEY STATION Coos County, Oregon (1897-1944)	
January	43.4	10.9
Februrary	45.5	8.9
March	47.8	8.0
April	50.5	4.7
May	53.6	3.3
June	57.9	1.7
July	61.3	0.4
August	62.2	0.4
September	59.5	2.2
October	54.7	4.6
November	48.2	9.8
December	44.5	10.4

Soils of the District generally have mean annual soil temperatures (at a depth of 20 inches) between 47 and 59 degrees F. and are therefore, classified in the mesic family grouping (U.S. Dept. of Agriculture Soil Survey Staff, 1975). For most soils the mean annual soil temperature is about 2°C warmer than the mean annual air temperature.

The frost-free season averages between 180 and 200 days inland and between 220 and 260 days along the coast. At the higher elevations of the mountains this frost-free season is probably less, but no data are available.

Air movement has an effect upon timber management and recreation along the coast. Coastal winds generally average between 15 and 20 miles per hour most of the year. Inland winds generally average between 5 and 7 miles per hour. The summer winds generally are moderate breezes prevailing from the north or northwest. Occasional winds up to 75 to 100 miles per hour occur that cause severe damage to timber.

C. Landforms and Topography

Landforms originate from either (1) depositional processes or (2) erosional processes (Thornbury, 1954). Major kinds of depositional landforms in the inventory area include (1) nearly level to gently sloping flood plains and (2) nearly level to steep slump benches.

Major types of erosional land forms include (1) gently sloping to moderately steep marine terraces; (2) steep to very steep sideslopes; (3) gently sloping to steep, narrow ridge crests; (4) gently sloping to moderately steep broad ridge tops; (5) steep to very steep, rounded ridge noses and (6) very steep to extremely steep headwalls. Figure 5 depicts a cross-sectional diagram of these landforms.

The characteristics of each landform are products of the interaction between (1) the materials which underlie them; (2) the processes that formed them and (3) the processes presently acting upon them (Beaulieu and Hughes, 1975).

Some definite relationships between soils, geologic materials and landforms in the District are shown in the block diagrams of Figures 6 and 7. Duncan and Steinbrenner (1972) have used soil-landform relationships to predict the Site Index for Douglas fir on Weyerhauser Co. forest lands of Oregon and Washington.

The topography of the inventory area generally consists of rugged and highly dissected terrain with steep, narrow V-shaped canyons and dendritic drainage pattern. These are characteristics of terrain that has developed in the Eocene sediments of the Coast Range. The coastal mountains of Curry County are an exception--the streams that flow westward into the Pacific Ocean have a parallel drainage pattern. The drainage pattern in the area bounded by Wassen Creek on the east, the Pacific

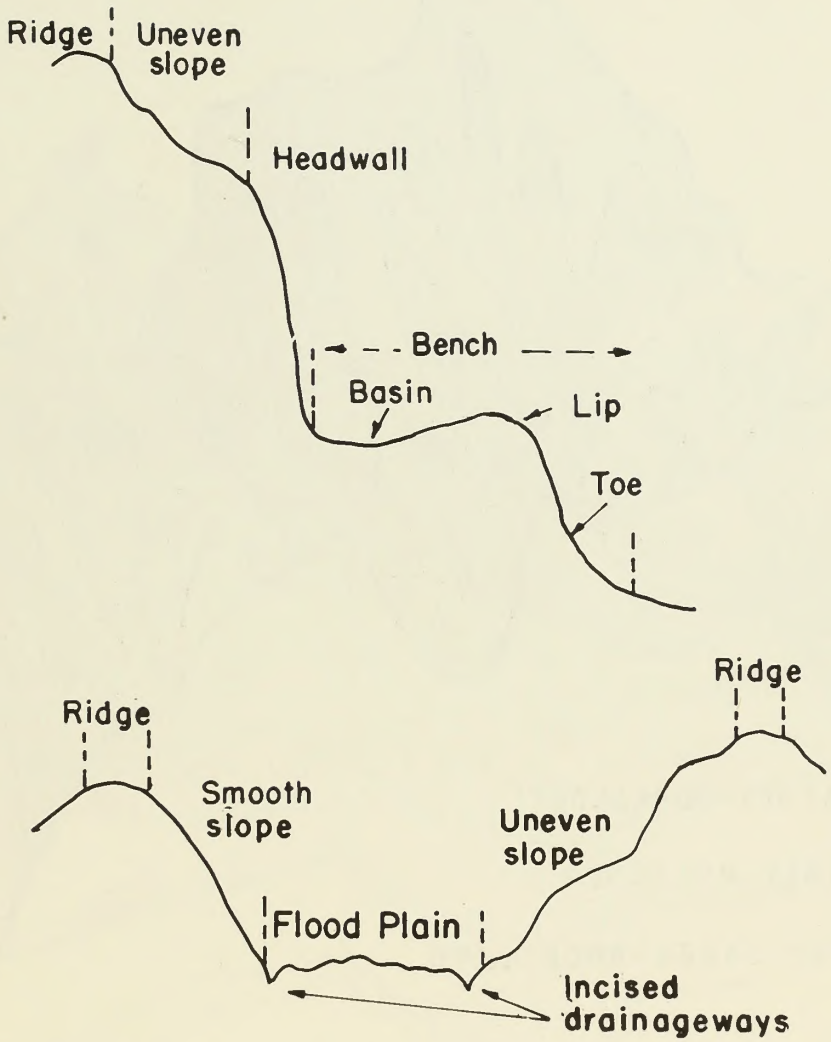

Figure 5. Cross Sectional Diagram of Typical Landforms in the Coos Bay District

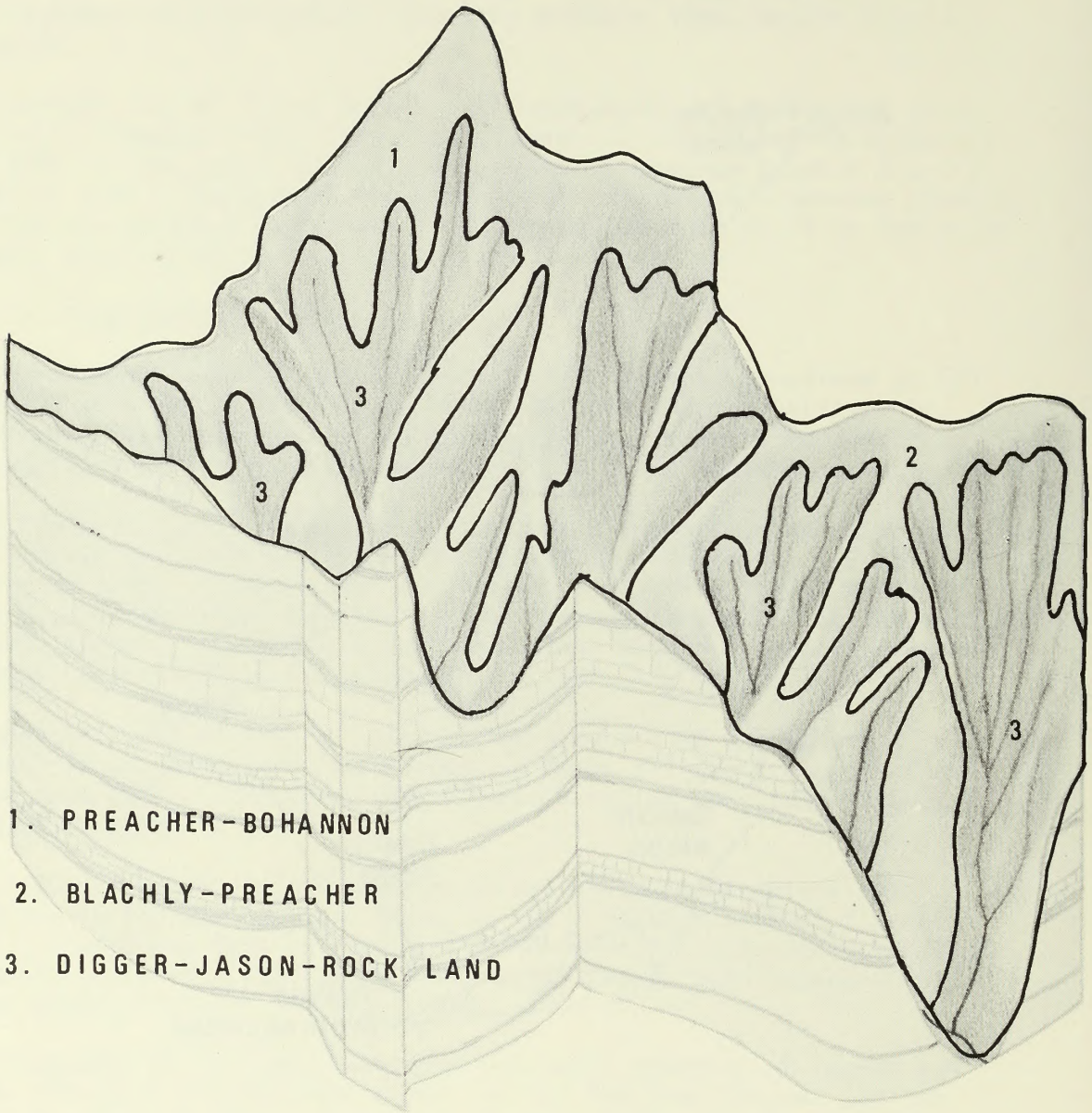

Figure 6. A block diagram showing the relationship between soil series and land form in Type I Sites (Terrain) of the Flournoy and Tyee Formations

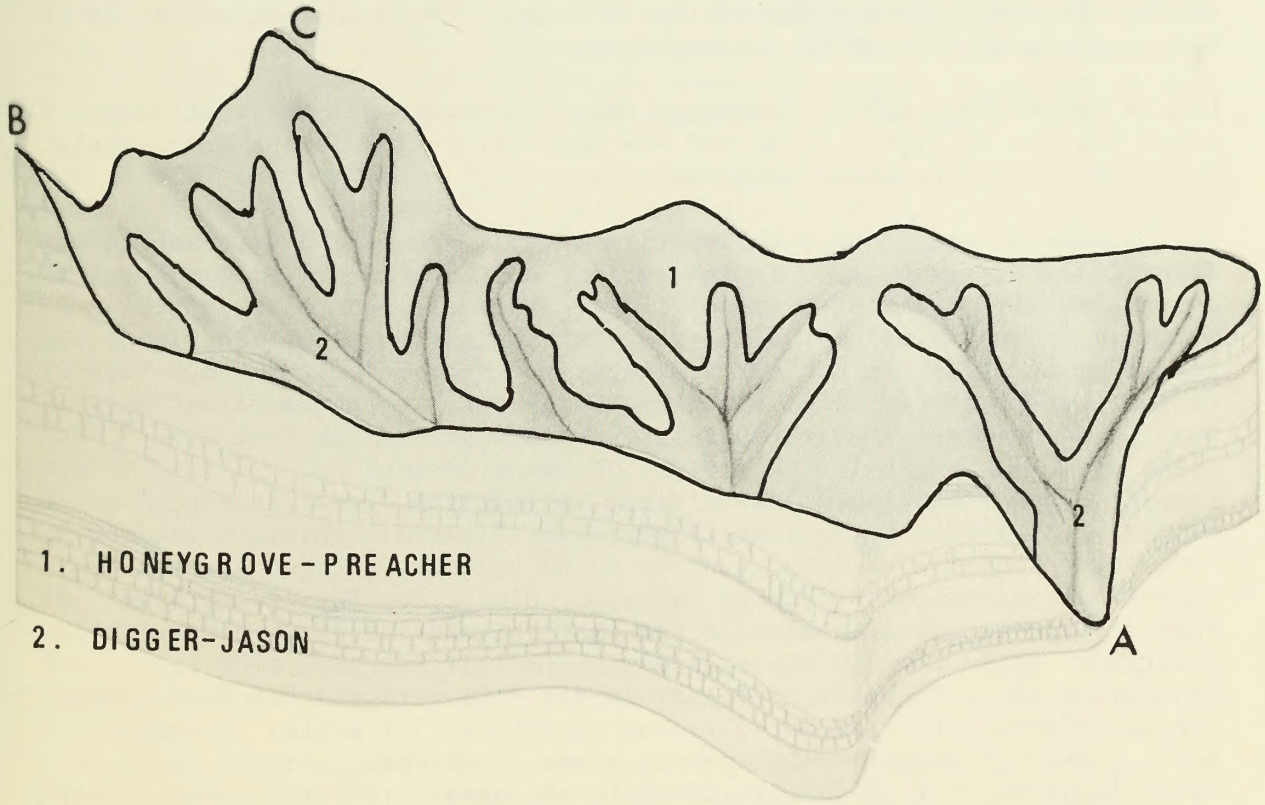

Figure 7. A block diagram showing the relationship between soil series and land form in Type II Sites (Terrain) of the Tyee, Lookingglass, Roseburg and Elkton Formations.

Ocean on the west, Smith River on the north and the Umpqua River on the south is unique. The pattern resembles a typical rectangular pattern with some characteristics of a trellis pattern. Mass movements, such as the one which formed Wassen Lake, may account for these differences in drainage pattern.

Slope stability problems within bedded sandstone and siltstone sediments of Western Oregon have been designated as either Type I or Type II (Burroughs, Chalfant, and Townsend, 1973). Type I slope stability problems occur in the Flournoy and Tyee Formations (Figure 6). Sites are characterized by very steep and extremely steep slopes with sharp ridges and high dissection density. Headwalls (fan-shaped basins) are present in the upper reaches of the drainage. The headwalls generally have slope gradients of 80 percent or greater.

Debris avalanches, debris flows and debris torrents are the most common slope failure on Type I sites and the headwall region is the most likely point of origin for these failures.

Soil commonly associated with Type I headwalls are of the Umpcoos (564), Jason (64), Digger (66), Unit 166 series, and Rock land. Soil generally associated with the ridges are of the Preacher (57) and Blachly (10) series. Bohannon (63) soils are associated with the steep sideslopes of Type I sites. The Smith River drainage from just below the North Fork to just beyond the South Fork and both sides of the Umpqua River from Dean Creek upstream to Scottsburg are areas representing Type I.

Type II slope stability problems occur in the Tyee, Lookingglass, Roseburg and Elkton Formations (Figure 7). Sites are characterized by sideslope gradients of 10 percent up to 80 percent. Ridges are rounded and sideslopes may be broken by benches. Dissection density is less than on Type I sites. Headwalls and small patches of exposed bedrock are rare. Soil commonly associated with Type II ridges are of the Honeygrove (14), Preacher (57) and Blachly (10) series. Benches usually are associated with Preacher (57) and Slickrock (54) soils. Bohannon soils generally occur on the smooth, steep sideslopes. Digger (66), Jason (64) and Unit 166 soils generally are associated with steep slopes at the heads of drainages.

The most unstable portions of Type II sites are the steep, concave slopes at the heads of drainages, the edges of benches, or those locations where ground water tends to accumulate. The Sandy Creek, Camp Creek, Big Creek and Soup Creek drainages illustrate the Type II sites.

Slumps and earth flows are the most common types of slope failure on sediments of the Otter Point Formation (Figure 8). Slopes of this terrain are characterized by a benchy, hummocky appearance with gradients of 20 to 50 percent.

Soils associated with the Otter Point Type of terrain are the Etelka (557) and Whobrey (501) series. The Baker Creek, Floras Creek and Rowland Creek drainages represent this Type of slope stability problem.

Slope stability problems in the Coos Bay District associated with geologic material, type of slope failure, and activity most affected are summarized briefly in Table 4. Figures 9 and 10 illustrate attempts at correcting cutbank slope failures in the Elkton Formation.

D. Drainage

The inventory area contains large portions of Coos, Smith, Coquille and Chetco River drainages. Small portions of the Umpqua and Rogue River drainages are also included in the inventory area. Minor river drainages partially within the inventory area include the Sixes River, Floras Creek, Euchre Creek and Hunter Creek drainages. Generally, these streams all exhibit a dendritic type of drainage pattern.

The Coos River originates in the Coast Range and terminates in the Pacific Ocean at Coos Bay. The main tributaries of the Coos system are the Millicoma River, South Fork Coos River and Williams River. The drainage basin is wholly within the Coast Range.

The main tributaries of the Coquille system are the North Fork, the East Fork, the Middle Fork and the South Fork. The South Fork drainage, the largest in areal extent, originates in the Klamath Mountains. The Middle Fork drainage is located approximately along the boundary between the Coast Range and Klamath Mountain Provinces. The East and North Fork drainages are entirely within the Coast Range Provinces. The main stem of the Coquille River terminates in the Pacific Ocean at Bandon.

The Smith River drainage is a subbasin of the huge Umpqua basin. It is wholly within the Coast Range and flows into the main Umpqua River at Reedsport. The Umpqua River originates in the Cascades, flows through the Coast Range and terminates in the Pacific Ocean at Winchester Bay.

The Rogue River originates in the Cascade Range, flows through the Klamath Mountains and terminates in the Pacific Ocean at Gold Beach.

The North Fork of the Chetco River, Bravo Creek and Ransom Creek drain into the main stem of the Chetco River subbasin which terminates in the Pacific Ocean at Brookings-Harbor. The Chetco subbasin is wholly within the Klamath Mountain Province.

The Sixes River, Floras Creek, Euchre Creek and Hunter Creek drainages all originate in the Klamath Mountain Province and terminate in the Pacific Ocean. Another minor drainage, the Pistol River system, originates on Siskiyou National Forest Lands. It flows through private lands and terminates in the Pacific Ocean.

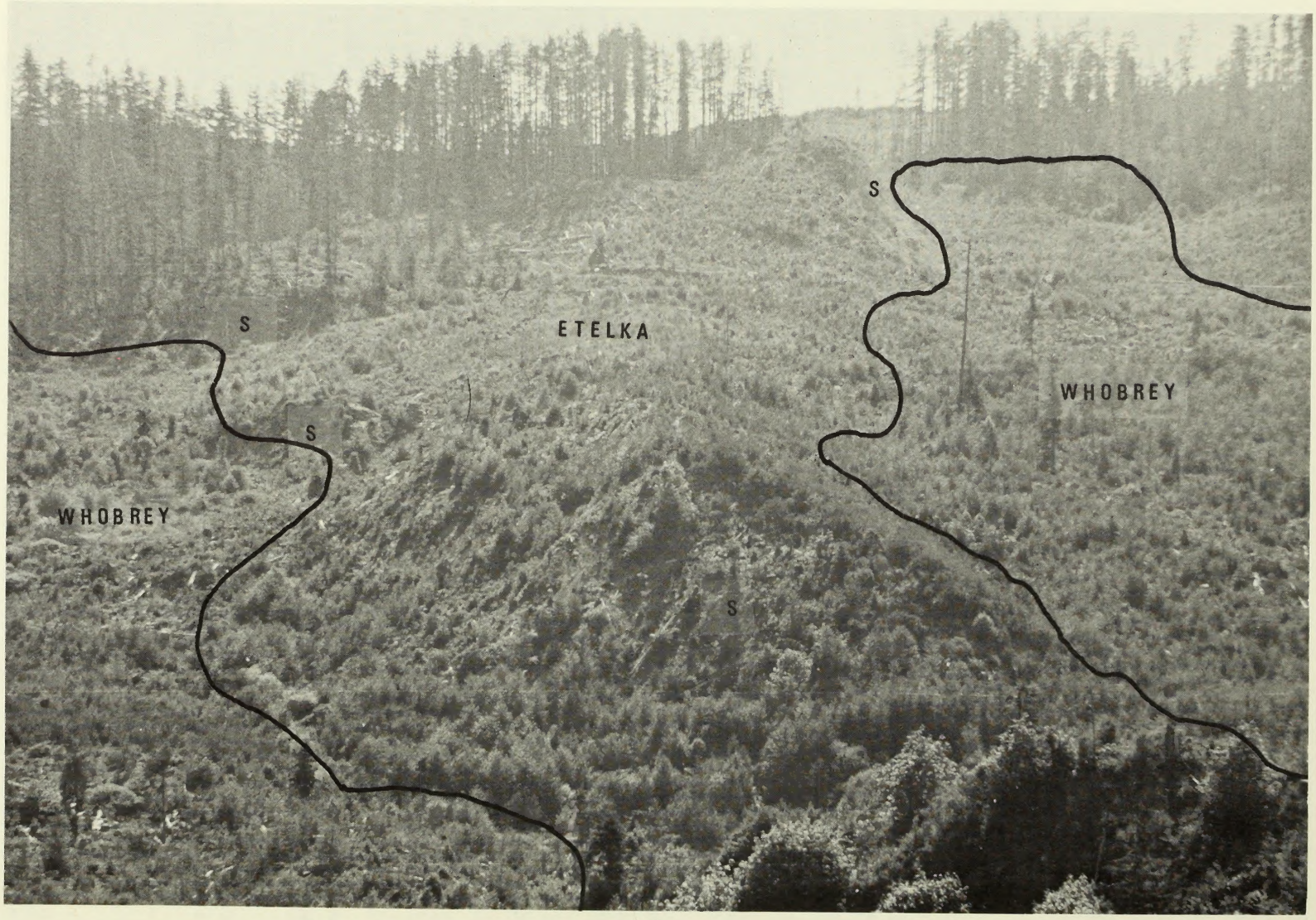

Figure 8. Soilscape showing the occurance of Etelka and Whoberg soils. Note the hummocky topography ans slump escarpments (s).

TABLE 4. SLOPE STABILITY PROBLEMS IN RELATION TO GEOLOGIC MATERIALS

Geologic Material	Type of Slope Failure	Activity Most Affected	Remarks
Bedded Sediments	Debris avalanches, debris flows, debris torrents, rock slides, and rock falls	Roads and Timber Harvest	Flournoy Formation and some Tyee formation. Very steep and extremely steep slopes with sharp ridges, headwalls and high dissection density. Very shallow to moderately deep, skeletal soils. (Type I sites)
Bedded Sediments	Rotational slumps, Translational slides and earthflow	Roads	Tyee formation - very deep soils, unconsolidated bedrock materials and steep slopes. (Type II sites)
Bedded Sediments	Slumps and earthflow	Roads	Elkton formation - very deep soils, unconsolidated bedrock materials and steep slopes. (Type II sites) (See Figures 11 and 12)
Bedded Sediments	Slumps and earthflow	Roads	Lookingglass and Roseburg formations - very deep soils, deeply weathered, unconsolidated materials and moderately steep slopes. (Type II sites)
Bedded Sediments	Slumps and earthflow	Roads	Otter Point formation - Soils with high shrink-swell behavior and deeply weathered, unconsolidated bedrock material.
Bedded Sediments	Slumps, earthflow and rockslide	Roads	Coaledo formation - very deep soils and deeply weathered unconsolidated bedrock materials. (Type II sites)
Volcanics	Slumps	Roads	Submarine basalts of the Roseburg formation - moderately deep to very deep soils and highly fractured bedrock materials (Type II sites)
Igneous	Debris avalanches, debris flows and slumps	Roads	Granitoid - Deep soils and deeply weathered, unconsolidated bedrock materials.
Metasediments	Slumps	Roads	Dothan formation - Deep soils and highly fractured and faulted bedrock materials. Small serpentine intrusions
Metamorphic	Slumps	Roads and Timber Harvest	Serpentine - Shallow, clayey soils and deeply weathered, highly fractured bedrock material.

Figure 9. Rock Buttress at toe of slope in slide correction. Elkton Formation in Type II Terrain along Heddin Creek BLM road.

Figure 10. Major Slide Correction in cutbank slope of access road located in the Elkton Formation. Visible slumps occurred subsequent to correction.

Stream gradients in the upper reaches average about 1 to 8 percent and in the lower valleys flatten to less than 0.25 percent.

Table 5 illustrates a few characteristics of the Umpqua, Coquille and Coos drainage basins.

TABLE 5. Mean Annual Yields of Water and Sediment from the Major Rivers in the Coos Bay District.

Drainage Basin	Drainage Areas (Square Miles)	Annual Yield Ac.ft.	Sediment p.p.m.	Sediment Yield Cu.Yd.
Umpqua	3623	5,410,000	150	876,766
Coquille	1058	2,400,000	97	256,036
Coos	415	1,590,000	58	100,430
Totals	5096	9,400,000		1,233,232

V. SOILS

A. Descriptions for the General Soil Map

A general soil association map is in the packet on the back cover of this publication. A soil association generally consists of two or three major soil series that occur together in a characteristic geographic pattern, and in defined proportional amounts. The soils that occur in one association may also occur in another, but in different relative amounts. They are named after the major soils, with the dominant soil series listed first, the next most abundant soil, second, and the third most common soil, third. Preacher-Bohannon-Jason and Bohannon-Jason-Preacher are examples of two soil associations.

The general soil map is useful for determining a broad perspective of the soils pattern for a large area or the entire District. The general soil association map, together with the soil association descriptions, can be used for general or broadscale planning of land use and management practices. The soil associations show major differences in soil slope, soil depth, land form, parent material or underlying rock, and in most cases, soil texture, because these properties were used to define the soil associations.

The soil associations are described below in terms of their physiographic position, parent material, major soil characteristics, climate, and proportions. The associations are arranged according to the number used for identifying each association on the general soil map.

1. Alluvial Land Association

This association consists of all the soils on floodplains and terraces along the major streams throughout the District. The soils formed in alluvium that ranges from very gravelly sands to clay in texture and from excessively drained to poorly drained. Most areas have slope gradients of less than 10 percent. This association makes up about 4 percent of the inventory area.

Alluvial land is used for timber production, wildlife habitat, recreational sites, and farming. Soil behavior varies widely because of the variation in soil characteristics. Many areas are very productive for timber because they are deep, loamy, and have a high moisture supplying capacity and are fertile. These riparian sites are good wildlife habitat because they provide food, water, and cover. They are also valuable for fish habitat because vegetation shades the streams, thereby keeping them cool. Vegetation also reduces stream bank erosion and sedimentation if left undisturbed. Flooding and highwater tables are hazards for locating buildings, sewage disposal systems, recreational sites, and low bridges.

2. Jory Association

This association occurs on moderately sloping foothills along the Umpqua River between Elkton and Scottsburg. Jory soils developed in fine textured colluvium from sedimentary and volcanic rocks in areas receiving less than 60 inches of precipitation. They are dry for long periods each summer. White oak and poison oak commonly grow on these soils. This association makes up about 2 percent of the area.

Deep, red, clayey Jory soils make up about 70 percent of the area and occur on old stable rounded foothills and uniform sideslopes. Other xeric soils, that were not mapped in the District because of their small extent, make up about 30 percent of the area. They include the moderately deep, red clayey Nekia soils and unclassified xeric, loamy-skeletal soils.

The soils of this association are used for farming, timber production, wildlife habitat and watershed. The long dry period during the summer is a chief limitation for timber production.

3. Honeygrove-Preacher Association

This association occurs mainly around Fairview and McKinley on moderately steep to steep ridges and foothills. These soils developed in medium and fine textured colluvium from sedimentary and volcanic rocks in areas receiving between 60 and 75 inches of precipitation. The soils are not dry for as much as 45 days during the summer. Douglas Fir is the dominant tree on these soils. This association makes up about 6 percent of the area.

Deep, red, well-developed, clayey Honeygrove soils make up about 70 percent of the area; and deep, brown, fine-loamy, Preacher soils make up about 30 percent of the area. The Honeygrove soils are mostly on the broad, rounded ridges and sideslopes. The Preacher soils are on the steeper sideslopes and narrow ridge crests. Mingled with the Honeygrove soils are minor inclusions of deep brown, clayey Apt soils, and moderately deep, red, clayey Preavine soils (which were not mapped in this inventory because of their minor extent). Mingled with the Preacher soils are minor inclusions of moderately deep fine-loamy Bohannon soils, and of the loamy-skeletal Digger soils.

The soils of this association are used for timber production, farming, wildlife habitat, and watershed. Compaction susceptability is a hazard on the Honeygrove soils.

4. Blachly-Preacher-Bohannon Association

This association occurs on gently sloping to steep ridgetops, sideslopes and slump benches between the East and Middle Forks of the Coquille River and on Callahan Ridge. These soils developed in fine and

medium textured colluvium from sedimentary rocks in areas receiving between 60 and 80 inches of precipitation. The soils are not dry for as much as 45 days during the summer. Douglas Fir is the dominant tree on these soils. This association makes up about 10 percent of the area.

Deep, red, well developed, fine Blachly soils make up about 50 percent of the area; deep, brown, fine-loamy Preacher soils make up about 30 percent of the area; and moderately deep, brown, fine-loamy Bohannon soils make up about 20 percent of the area. The Blachly soils are mostly on the gentle sloping, slumpy ridgetops and sideslopes. The Preacher soils are mostly on moderately steep, slumpy sideslopes. The Bohannon soils are on the steep sideslopes and finger ridges. Mingled with the Blachly soils are minor inclusions of red, clayey Honeygrove soils. Mingled with the Preacher and Bohannon soils are minor inclusions of the moderately deep, loamy-skeletal Digger soils and of the shallow, brown, loamy-skeletal Jason soils.

The soils of this association are used for timber production, farming, wildlife habitat and watershed. Compaction susceptibility is a hazard on the Blachly soils.

5. Preacher-Blachly-Bohannon Association

This association occurs on gently sloping to steep ridgetops, sideslopes, and slump benches widely scattered between Catching Slough and Fairview, and between Tioga Creek and the Middle Fork of the Coquille River east of Sandy Creek. These soils developed in fine and medium textured colluvium from sedimentary rocks in areas receiving between 60 and 80 inches of precipitation. The soils are not dry for as much as 45 days during the summer. Douglas Fir is the dominant tree on these soils. This association makes up about 20 percent of the area.

Deep, brown, fine-loamy Preacher soils make up about 50 percent of the area; deep, red, fine Blachly soils make up about 30 percent of the area; and moderately deep, brown, fine-loamy Bohannon soils make up about 20 percent of the area. The Preacher soils are mostly on moderately steep, slumpy sideslopes. The Blachly soils are mostly on the gently sloping, slumpy ridgetops and sideslopes. The Bohannon soils are on the steep sideslopes and finger ridges. Mingled with the Preacher soils are minor inclusions of moderately deep, brown, loamy-skeletal Digger soils. Mingles with the Blachly soils are minor inclusions of deep, red, well developed, clayey Honeygrove soils. Mingled with the Bohannon soils are minor inclusions of the shallow, brown, loamy-skeletal Jason soils.

6. Preacher-Slickrock-Bohannon Association

This association occurs on gently sloping to steep ridgetops, sideslopes and slump benches in the vicinity of Ferntop, Little Mill Creek and Steampot Ridge, north of Scottsburg, Oregon. These soils developed in medium-textured colluvium from sedimentary rocks in areas

receiving between 70 and 90 inches of precipitation. The soils are not dry for as much as 45 days during the summer. Douglas fir is the dominant tree on these soils. This association makes up about 1 percent of the area.

Deep, brown, fine-loamy Preacher soils make up about 50 percent of the area; deep, black, Slickrock soils make up about 30 percent of the area; and moderately deep, brown, fine-loamy Bohannon soils make up about 20 percent of the area. The Preacher soils are mostly on gently sloping, slumpy ridgetops and sideslopes. The Slickrock soils are mostly on gently sloping and moderately steep slump benches and uneven sideslopes. The Bohannon soils are on the steep sideslopes and finger ridges. Mingled with the Preacher soils are minor inclusions of deep, red, fine Blachly soils. Mingled with the Slickrock soils are minor inclusions of the deep, brown, clayey Apt soils. Mingled with the Bohannon soils are minor inclusions of the shallow, brown, loamy-skeletal Jason soils.

The soils of this association are used for timber production, farming, wildlife habitat and watershed. Landslide and erosion susceptibility are hazards on Slickrock soils.

7. Preacher-Digger-Jason Association

This association occurs on gently sloping to extremely steep ridgetops, sideslopes, slump benches and headwalls in the Burnt Mountain Area at the headwaters of the East Fork Coquille River and in the vicinity of Mehl Creek and Waggoner Creek south of Elkton in the Loon Lake Resource Area. These soils developed in medium textured and coarse textured colluvium from sedimentary rocks in areas receiving between 60 and 80 inches of precipitation. The soils are not dry for as much as 45 days during the summer. Douglas Fir is the dominant tree on these soils. This association makes up about 5 percent of the area.

Deep, brown, fine-loamy Preacher soils make up about 50 percent of the area; moderately deep, brown, loamy-skeletal Digger soils make up about 30 percent of the area; and shallow, brown, loamy-skeletal Jason soils make up about 20 percent of the area. The Preacher soils are mostly on the gently sloping slumpy ridgetops and sideslopes. The Digger soils are mostly on the steep sideslopes and finger ridges. The Jason soils are mostly on the very steep sideslopes and headwalls. Mingled with the Preacher soils are minor inclusions of the deep, red, fine Blachly soils. Mingled with the Digger soils are minor inclusions of the moderately deep, brown, fine-loamy Bohannon soils and the deep, brown, loamy-skeletal Unnamed 166 soils. The soils of this association are used for timber production, farming, wildlife habitat and watershed. Landslide and erosion susceptibility is a hazard on Jason soils.

8. Bohannon-Jason-Preacher Association

This association occurs on steep to very steep ridgetops, sideslopes and headwalls throughout Coos County. These soils developed in medium-textured and coarse-textured colluvium from sedimentary rocks in areas receiving between 60 and 100 inches of precipitation. The soils are not dry for as much as 45 days during the summer. Douglas Fir is the dominant tree on these soils. The association makes up about 10 percent of the area.

Moderately deep, brown, fine-loamy Bohannon soils make up about 50 percent of the area; shallow, brown, loamy-skeletal Jason soils make up about 30 percent of the area; and deep, brown, fine-loamy Preacher soils make up about 20 percent of the area.

The Bohannon soils are mostly on the steep sideslopes and finer ridges. The Jason soils are mostly on the very steep sideslopes and headwalls. The Preacher soils are on the gently sloping and moderately steep slumping ridgetops and sideslopes. Mingled with the Bohannon soils are minor inclusions of the moderately deep, brown, loamy-skeletal Digger soils. Mingled with the Jason soils are minor inclusions of the brown, lithic, loamy-skeletal Umpcoos soils and rock land. Mingled with the Preacher soils are minor inclusions of the deep, red, fine Blachly soils.

The soils of this association are used for timber production, farming, wildlife habitat and watershed.

9. Digger-Apt-Jason Association

This association occurs on steep to very steep slumpy sideslopes, finger ridges and headwalls at the head ends of Camp Creek, Little Camp Creek, Heddin Creek and Mehl Creek in the Loon Lake Resource Area. These soils developed in coarse-textured and fine-textured colluvium from sedimentary rocks in areas receiving between 60 and 90 inches of precipitation. The soils are not dry for as much as 45 days during the summer. Douglas Fir is the dominant tree on these soils. This association makes up about 1 percent of the area.

Moderately deep, brown, loamy-skeletal Digger soils make up about 50 percent of the area; deep, brown, clayey Apt soils make up about 30 percent of the area, and shallow, brown, loamy-skeletal Jason soils make up about 20 percent of the area. The Digger soils are mostly on the very steep sideslopes and finger ridges. The Apt soils are mostly on the steep, slumpy sideslopes. The Jason soils are on the very steep sideslopes and headwalls. Mingled with the Digger soils are minor inclusions of the moderately deep, brown, fine-loamy Bohannon soils; and the deep brown, loamy-skeletal Unnamed 166 soils. Mingled with the Apt soils are minor inclusions of the deep, brown, fine-loamy Preacher soils. Mingled with the Jason soils are minor inclusions of the brown, lithic, loamy-skeletal Umpcoos soils, and rock land.

The soils of this association are used for timber production, wildlife habitat and watershed.

10. Digger-Jason-Rock Land Association

This association occurs on very steep and extremely steep narrow ridgetops, finger ridges, sideslopes and headwalls throughout the Coos Bay District. These soils developed in coarse textured colluvium from sedimentary rocks in areas receiving between 60 and 100 inches of precipitation. The soils are not dry for as much as 45 days during the summer. Douglas Fir is the dominant tree on these soils. This association makes up about 5 percent of the area.

Moderately deep, brown, loamy-skeletal Digger soils make up about 45 percent of the area; shallow, brown, loamy-skeletal Jason soils make up about 35 percent of the area; and Rock Land makes up the remaining 20 percent of the area.

The Digger soils are mostly on the very steep finger ridges and sideslopes. The Jason soils are mostly on the narrow ridgetops and very steep to extremely steep sideslopes and headwalls. The Rock land is on the extremely steep sideslopes and rock headwalls. Mingled with the Digger soils are minor inclusions of the deep, brown, loamy-skeletal Unnamed 166 soils and the moderately deep, brown, fine-loamy Bohannon soils. Mingled with the Jason soils and Rock land are the lithic, brown, loamy-skeletal Umpcoos soils.

The soils of this association are used for timber production, wildlife habitat and watershed.

11. Jason-Bohannon-Rock Land Association

This association occurs on very steep and extremely steep narrow ridgetops, finger ridges, sideslopes and headwalls scattered throughout the Coos Bay District. These soils developed in coarse-textured and medium-textured colluvium from sedimentary rocks in areas receiving between 60 and 100 inches of precipitation. The soils are not dry for as much as 45 days during the summer. Douglas Fir is the dominant tree on these soils. This association makes up about 16 percent of the area.

Shallow, brown, loamy-skeletal Jason soils make up about 50 percent of the area; moderately deep, brown, fine-loamy Bohannon soils make up about 30 percent of the area; and rock land makes up about 20 percent of the area. The Jason soils are mostly on the narrow ridgetop extremely steep sideslopes and headwalls. The Bohannon soils are mostly on the very steep finger ridges. The rock land is on the extremely steep sideslopes and rocky headwalls. Mingled with the Jason soils are minor inclusions of the lithic, brown, loamy-skeletal Umpcoos soils. Mingled with the Bohannon soils are minor inclusions of the deep, brown, loamy-

skeletal Unnamed 166 soils and the moderately deep, brown, loamy-skeletal Digger soils. Mingled with the rock land are minor inclusions of the lithic, brown, loamy-skeletal Umpcoos soils.

The soils of this association are used for timber production, wildlife habitat and watershed. Erosion susceptibility is a hazard on Jason soils.

12. Whobrey-Etelka-Digger Association

This association occurs on gently sloping to very steep slumping sideslopes, ridgetops, saddles, interfluves and finger ridges in the Grizzly Mountain, Baker Creek, Indian Creek, Sixes River and Floras Creek Watersheds of Curry County. These soils developed in fine-textured and coarse-textured colluvium from sedimentary rocks in areas receiving between 60 and 100 inches of precipitation. The soils are not dry for as much as 45 days during the summer. Douglas Fir is the dominant tree on these soils. This association makes up about 7 percent of the area.

Deep, brown, fine-silty over clayey Whobrey soils make up about 65 percent of the area; deep, fine Etelka Soils make up about 25 percent of the area; and moderately deep, brown, loamy-skeletal Digger soils make up the remaining 15 percent of the area.

The Whobrey soils are mostly on the gently sloping to steep, slumping sideslopes, ridgetops and saddles. The Etelka soils are mostly on the convex, gently sloping to steep knobs on ridgetops, finger ridges and interfluves. The Digger soils are on steep and very steep sideslopes and nose ridges. Mingled with the Whobrey soils are minor inclusions of the deep, brown, fine-loamy Preacher soils. Mingled with the Etelka soils are minor inclusions of the moderately deep, brown, fine-loamy Bohannon soils and the deep, red, fine Blachly soils. Mingled with the Digger soils are minor inclusions of the unnamed deep, brown, loamy-skeletal over fragmental Unit 505 soils and the shallow, brown, loamy-skeletal Jason soils.

The soils of this association are used for timber production, farming, wildlife habitat and watershed. Landslide susceptibility and compaction susceptibility are hazards on the Whobrey and Etelka soils.

13. Unit 503-Rock Land Association

This association occurs on gently sloping to steep broad ridges, slumping sideslopes and headwalls in the Curry County Area at the headwaters of Hunter Creek, Jim Hunt Creek and Saunders Creek and in the vicinity of Signal Buttes, Red Flat and Flycatcher Spring. These soils developed in fine-textured, medium-textured and coarse-textured residuum and colluvium from ultramafic rocks (Peridotite and Serpentinite) in areas receiving between 60 and 100 inches of precipitation. The

soils are not dry for as much as 45 days during the summer. Knobcone pine is the dominant tree on these soils. This association makes up about 6 percent of the area.

Deep, red, fine-loamy Unnamed Unit 503 soils make up about 70 percent of the area and rock land makes up about 30 percent of the area. The Unit 503 soils are mostly on the broad ridgetops, slump benches and uneven sideslopes. The rockland is on the steep sideslopes and rock outcrops. Mingled with the Unit 503 soils are minor inclusions of unnamed, red, shallow, loamy-skeletal soils derived from ultramafic rocks (periodotite and serpentinite). Mingled, also, with the Unit 503 soils are minor inclusions of deep, red, clayey Edson soils; and the moderately deep, brown, loamy-skeletal over fragmental unnamed Unit 505 soils. Both of these have developed in colluvium from schistose materials. Mingled, also, with the Unit 503 soils are minor inclusions of unnamed deep, red, fine-loamy Unit 520 soils and unnamed, moderately deep red, loamy-skeletal Unit 521 soils. Both of these soils formed in materials weathered from old volcanic rocks.

The soils of this association are used for recreation, wildlife habitat, watershed, mining and education.

14. Unit 520-Unit 521-Rock Land Association

This association occurs on moderately steep to very steep sideslopes, buttes and ridges in the Curry County Area of Bosley Butte, Palmer Butte and Morton Butte in the headwaters of the North Fork Pistol River, Bravo Creek, Mayfield Creek and the North Fork Chetco River.

15. Dement-Unit 530-Unit 524 Association

This association occurs on gently sloping to very steep broad ridges, slump benches, and uneven sideslopes in the Curry County Areas of Black Mound, Red Mount, Cassidy Butte, Hazel Camp and Gardner Ridge in the headwaters of the North Fork Chetco River and the South Fork Pistol River. These soils developed in fine-textured, medium-textured, and coarse-textured colluvium and residuum from sedimentary rocks of the Dothan Formation in areas receiving between 55 and 100 inches of precipitation. The soils may be dry for as much as 45 days during the summer. Douglas fir and tanoak are the dominant trees on these soils. This association makes up about 4 percent of the area.

Deep, red, clayey Dement soils make up about 45 percent of the area; the unnamed, moderately deep, brown, loamy-skeletal, Unit 530 soils make up about 35 percent of the area; and the unnamed, deep, brown, fine-loamy, Unit 524 soils make up about 20 percent of the area. The Dement soils are mostly on ridgetops, ridge noses and sideslopes. The Unit 524 soils are mostly on broad ridgetops (edges of prairies, such as Yank Prairie, Northern Prairie, etc.) and concave slumping sideslopes and slump benches. Seeps and year-around flowing springs are often associated with Unit 524 soils. Mingled with the Dement soils are minor inclusions of the unnamed, deep, red, fine-loamy Unit 520 soils; and the deep, red, clayey Edson soils. Mingled with the Unit 530 soils are minor inclusions of the unnamed moderately deep, red, loamy-skeletal Unit 521 soils and rock land. Mingled with the Unit 524 soils are minor inclusions of unnamed, deep, black, loamy-skeletal soils, and unnamed moderately deep, brown, loamy-skeletal over fragmental Unit 505 soils.

The soils of this association are used for timber, farming, wildlife habitat, recreation and watershed. Compaction susceptibility is a hazard on Dement soils.

16. Edson-Unit 505 Association

This association occurs on gently sloping to steep, broad ridges and slumping sideslopes in the Curry County Areas of Lobster Hill, Sawtooth Mountains, Brushy Bald Mountains and Bark Shanty Mountain in the headwaters of Lobster Creek and the Rogue River. It occurs in another distinctly separate area of the White Mountains, Edson Butte, Summit Mountain, and Eightmile Prairie Mountain region in the headwaters of Edson Creek, Willow Creek, the West Fork Floras Creek and the South Fork Floras Creek. These soils developed in fine-textured and coarse-textured colluvium and residuum from schistose rocks in areas receiving between 60 to 100 inches of precipitation. The soils may be dry for as much as 45 days during the summer. Douglas fir, tanoak and western hemlock are the dominant trees on these soils. This association makes up about 6 percent of the area.

Deep, red, clayey Edson soils make up about 70 percent of the area; and the unnamed, deep, brown, loamy-skeletal over fragmental Unit 505 soils make up about 30 percent of the area. The Edson soils are mostly on gently sloping broad ridgetops and moderately steep slump benches and sideslopes. Unti 505 soils are mostly on rounded ridges and concave, slumping sideslopes. Mingled with the Edson soils are minor inclusions of deep, red, fine Dement soils; deep, brown, fine Etelka soils; and deep, brown, fine-silty over very dark gray, clayey Whobrey soils. Mingled with the Unit 505 soils are minor inclusions of rock land.

The soils of this association are used for timber, wildlife habitat, recreation, farming and watershed. Compaction susceptibility is a hazard on Edson soils.

B. Descriptions of Soils Series, Soil Behavior and Mapping Units

In this section, the soils of the Coos Bay District inventory area are listed in numerical order of the map symbol and described. Each soil description has six distinct parts in the following order: (1) an opening paragraph that describes the major soil properties and landscape features; (2) a condensed description of a typical profile of that series; (3) variations or range in characteristics of important physical properties; (4) a discussion of the soil setting that includes general location, geology, land form, climate and comparison with other soils; (5) a discussion of how the soil behaves for different uses; and (6) a description of all the mapping units in which the subject soil is dominant.

Soils names, as well as numbers, are included for those soil series named and correlated by the Soil Conservation Service. Numbers appear in parenthesis with the named soils for easy reference.

The slope gradient classes used in the mapping unit descriptions are defined in Table 6.

Soil depth is an important differentation characteristic for defining soil series. Five depth classes are used and are defined as follows: (1) very shallow, less than 10 inches thick; (2) shallow, 10 to 20 inches thick; (3) moderately deep, 20 to 40 inches thick; (4) deep, 40 to 60 inches thick; and (5) very deep, more than 60 inches thick.

Table 6. Legend for Slope Gradient Phases

Slope Class Symbol	Percent Gradient	Slope Class Name
V	0 to 10	Nearly level to gently sloping
W	10 to 35	Moderately steep
X	35 to 60	Steep
Y	60 to 80	Very Steep
Z	80+	Extremely steep

The acreage and proportionate extent of each kind of soil is given in Table 7. These figures are given by resource area, public vs. private ownership, and for the total district. The acreage information for the various kinds of soils will be valuable in planning the allowable timber harvest, reforestation requirements, short and long term fertilizing programs, and a variety of other resource management programs.

(1) Alluvial Land

Alluvial Land is a miscellaneous land type consisting of deep and very deep, well to poorly-drained soils developed in alluvium. They occur on floodplains, alluvial fans and river terraces throughout the inventory area.

Variations: Depth to bedrock is generally deeper than 5 feet. Amount of coarse fragments range from none to over 50 percent gravels and cobbles. Surface and subsoil textures range from gravelly sands to silty clays and clays. Most areas are medium-textured or loam. Drainage class ranges from well to poorly-drained, but most areas are well or moderately well-drained. The areas on terraces are generally well-drained.

Setting: Alluvial Land occurs on nearly level to sloping floodplains, alluvial fans and river terraces at elevations of 10 to 1,000 feet. Slope gradients range from 0 to 10 percent. The soils formed in alluvium from sedimentary, volcanic and metamorphic rocks.

Alluvial Land formed in a marine climate having an annual precipitation of 40 to 120 inches, with a dry summer season, mean annual temperature of 52° F., and average January temperatures of 43° F., is usually moist, and the loamy and clayey areas are dry for less than 45 days in the upper part of the root zone during the dry summer season. The average frost-free season is about 190 days. The natural vegetation varies with the degree of wetness. The well and moderately well-drained areas support Douglas fir, western hemlock and red alder with an understory of shrubs and grasses. The somewhat poorly and poorly-drained areas support hemlock, red cedar, big-leaf maple and red alder trees with an understory of shrubs, grasses and skunk cabbage. Many areas in the broader valleys have been cleared and cultivated.

Alluvial Land is associated with a number of soils on adjacent uplands, such as, soils of the Blachly, Slickrock, Apt, Edson, Honeygrove, Bohannon, Digger, Jory and Preacher series.

Soil Behavior: Alluvial land is used for timber production, water supply, recreation, farming, homesites and by wildlife. The dominant trees are Douglas fir, western hemlock, myrtle and red alder in the better-drained areas and hemlock, red cedar, big-leaf maple and alder in the poorer-drained areas.

TABLE 7. ACREAGE AND PROPORTIONATE EXTENT OF EACH SOIL SLOPE PHASE BY RESOURCE AREA, OWNERSHIP, AND FOR THE ENTIRE DISTRICT

Map Symbol	Resource Area											
	Smith-Umpqua		Loon Lake		Coos River		Burnt Mtn.		Myrtlewood		Total	
	Public	Private	Public	Private	Public	Private	Public	Private	Public	Private	Public	Private
	acres & percent	acres & percent	acres & percent	acres & percent	acres & percent	acres & percent	acres & percent	acres & percent	acres & percent	acres & percent	acres & percent	acres & percent
1	1950 (2.32)	820 (3.43)	470 (1.23)	740 (6.18)	1800 (3.94)	1710 (9.84)	1940 (3.68)	3790 (13.54)	2500 (2.38)	4420 (9.17)	8660 (2.66)	11,480 (8.86)
10V	381 (0.33)	62 (0.26)			267 (0.59)				63 (0.06)		611 (0.19)	62 (0.05)
10W	1156 (1.38)	352 (1.47)	178 (0.47)	117 (0.98)	3152 (6.91)	892 (5.13)	3756 (7.12)	2214 (7.91)	10,644 (10.14)	6405 (13.29)	18,886 (5.80)	9980 (7.71)
10X	2129 (2.53)	430 (1.80)	357 (0.94)	387 (3.23)	1684 (3.69)	501 (2.88)	1520 (2.88)	839 (3.00)	5621 (5.85)	3204 (6.65)	11,311 (4.48)	5361 (4.14)
10Y	214 (0.25)	94 (0.39)	83 (0.22)	9 (0.08)	333 (0.73)	6 (0.03)			37 (0.04)	18 (0.04)	667 (0.19)	127 (0.10)
12W	119 (0.14)		126 (0.33)	217 (1.81)							245 (0.08)	217 (0.17)
12X	51 (0.06)		314 (0.82)	93 (0.78)							365 (0.11)	93 (0.07)
14W	637 (0.76)	305 (1.28)	577 (1.51)	330 (2.76)	2372 (5.20)	1525 (8.78)	1631 (3.09)	830 (2.97)	140 (0.13)	209 (0.43)	5357 (1.65)	3199 (2.47)
14X	2249 (2.68)	852 (3.56)	651 (1.71)	205 (1.71)	2850 (6.25)	967 (5.57)	1773 (3.36)	980 (3.50)	4 (0.004)	25 (0.05)	7527 (2.31)	3029 (2.34)
14Y	38 (0.05)	13 (0.05)									38 (0.01)	13 (0.01)
50W	28 (0.03)	22 (0.09)	706 (1.85)	258 (2.16)	203 (0.44)	23 (0.13)	17 (0.03)	30 (0.11)	80 (0.08)		1034 (0.32)	333 (0.26)
50X	136 (0.16)	64 (0.26)	1712 (4.49)	803 (6.71)	579 (1.27)	55 (0.32)	118 (0.22)				2545 (0.78)	922 (0.71)
50Y			1435 (3.76)	714 (5.97)	93 (0.20)		194 (0.37)				1722 (0.53)	714 (0.55)

TABLE 7 (cont'd) ACREAGE AND PROPORTIONATE EXTENT OF EACH SOIL SLOPE PHASE BY RESOURCE AREA, OWNERSHIP, AND FOR THE ENTIRE DISTRICT

Map Symbol	Resource Area: Smith-Umpqua		Loon Lake		Coos River		Burnt Mtn.		Myrtlewood		Total	
	Public	Private	Public	Private	Public	Private	Public	Private	Public	Private	Public	Private
	acres & percent	acres & percent	acres & percent	acres & percent	acres & percent	acres & percent	acres & percent	acres & percent	acres & percent	acres & percent	acres & percent	acres & percent
54W	80 (0.10)	98 (0.41)			14 (0.03)						93 (0.03)	98 (0.08)
54X	825 (1.00)	229 (0.96)			34 (0.07)						859 (0.26)	229 (0.18)
57V	31 (0.04)						159 (0.30)	12 (0.04)	36 (0.03)		226 (0.07)	12 (0.01)
57W	1561 (1.86)	750 (3.14)	1706 (4.47)	384 (3.21)	3336 (7.31)	1709 (9.84)	9618 (18.24)	4162 (14.87)	12,250 (11.67)	7121 (14.77)	28,471 (8.75)	14,126 (10.91)
57X	8238 (9.81)	2199 (9.20)	5152 (13.51)	1065 (8.90)	5371 (11.77)	1764 (10.15)	5610 (10.64)	2865 (10.24)	11,752 (11.19)	8086 (16.78)	36,123 (11.10)	15,979 (12.35)
57Y	2469 (2.94)	1198 (5.01)	4472 (11.73)	785 (6.56)	1008 (2.21)	85 (0.49)	385 (0.73)	166 (0.59)	1352 (1.29)	668 (1.39)	9686 (2.98)	2902 (2.24)
57BW					230 (0.50)	300 (1.73)					230 (0.07)	300 (0.23)
57BX					40 (0.09)	220 (1.27)					40 (0.01)	220 (0.17)
63W	246 (0.29)	67 (0.28)	65 (0.17)	36 (0.30)	1556 (3.41)	588 (3.38)	1979 (3.75)	665 (2.38)	1227 (1.17)	1092 (2.27)	5073 (1.56)	2448 (1.89)
63X	4268 (5.08)	1164 (4.87)	777 (2.04)	256 (2.14)	5778 (12.69)	2244 (12.92)	6490 (12.31)	2321 (8.30)	5242 (4.99)	4259 (8.84)	22,565 (6.93)	10,244 (7.91)
63Y	17,909 (20.13)	2626 (10.99)	6373 (16.71)	1494 (12.48)	3981 (8.73)	903 (5.20)	2817 (5.34)	1501 (5.36)	1266 (1.21)	1252 (2.60)	31,346 (9.63)	7776 (6.01)
64W							21 (0.04)		22 (0.02)	14 (0.03)	43 (0.01)	14 (0.01)

TABLE 7 (cont'd) ACREAGE AND PROPORTIONATE EXTENT OF EACH SOIL SLOPE PHASE BY RESOURCE AREA, OWNERSHIP, AND FOR THE ENTIRE DISTRICT

Map Symbol	Resource Area: Smith-Umpqua Public	Smith-Umpqua Private	Loon Lake Public	Loon Lake Private	Coos River Public	Coos River Private	Burnt Mtn. Public	Burnt Mtn. Private	Myrtlewood Public	Myrtlewood Private	Total Public	Total Private
	acres & percent	acres & percent	acres & percent	acres & percent	acres & percent	acres & percent	acres & percent	acres & percent	acres & percent	acres & percent	acres & percent	acres & percent
6$X	2320 (2.76)	697 (2.92)	696 (1.82)	454 (3.79)	2088 (4.58)	578 (3.33)	2598 (4.93)	1120 (4.00)	2612 (2.49)	1645 (3.41)	10,314 (3.17)	4494 (3.47)
64Y	23,355 (27.80)	6018 (25.17)	6042 (15.85)	1687 (14.09)	3292 (7.22)	1054 (6.07)	3416 (6.48)	1845 (6.59)	5377 (5.12)	2150 (4.46)	41,482 (12.75)	12,754 (9.85)
64Z	572 (0.68)						178 (0.34)	59 (0.21)	126 (0.12)	31 (0.06)	876 (0.27)	90 (0.07)
66W	96 (0.11)	13 (0.05)	758 (1.99)	151 (1.26)	21 (0.05)	4 (0.02)	311 (0.59)	149 (0.53)	1097 (1.04)	955 (1.98)	2283 (0.70)	1272 (0.98)
66X	1132 (1.35)	485 (2.03)	1629 (4.27)	511 (4.27)	50 (0.11)	10 (0.06)	252 (0.48)	258 (0.92)	3944 (3.76)	1315 (2.73)	7007 (2.15)	2579 (1.99)
66Y	5910 (7.03)	2800 (11.71)	2168 (5.69)	883 (7.38)			106 (0.20)	105 (0.38)	4262 (4.06)	904 (1.88)	12,446 (3.82)	4692 (3.63)
66Z	358 (0.43)								56 (0.05)	22 (0.05)	414 (0.13)	22 (0.02)
166X	41 (0.05)	15 (0.06)					5 (0.01)	17 (0.06)	5 (0.004)	6 (0.01)	51 (0.02)	38 (0.03)
166Y	92 (0.11)	34 (0.14)					11 (0.02)	38 (0.14)	13 (0.01)	14 (0.03)	116 (0.04)	86 (0.07)
501W							25 (0.05)		2658 (2.49)	36 (0.07)	2683 (0.81)	36 (0.03)
501X							10 (0.02)		2125 (2.02)	16 (0.03)	2135 (0.66)	16 (0.01)
501Y									88 (0.08)		88 (0.03)	

TABLE 7 (cont'd) ACREAGE AND PROPORTIONATE EXTENT OF EACH SOIL SLOPE PHASE BY RESOURCE AREA, OWNERSHIP, AND FOR THE ENTIRE DISTRICT

Map Symbol	Resource Area											
	Smith-Umpqua		Loon Lake		Coos River		Burnt Mtn.		Myrtlewood		Total	
	Public	Private	Public	Private	Public	Private	Public	Private	Public	Private	Public	Private
	acres & percent	acres & percent	acres & percent	acres & percent	acres & percent	acres & percent	acres & percent	acres & percent	acres & percent	acres & percent	acres & percent	acres & percent
503W									122 (0.12)		122 (0.04)	
503X									284 (0.27)		284 (0.09)	
505X									1074 (1.02)		1074 (0.33)	
520W									317 (0.30)		317 (0.10)	
520X									954 (0.91)		954 (0.29)	
520Y									501 (0.48)		501 (0.15)	
521W									317 (0.30)		317 (0.10)	
521X									918 (0.87)		918 (0.28)	
521Y									430 (0.41)		430 (0.13)	
524W									661 (0.63)		661 (0.20)	
524X									1543 (1.47)		1543 (0.47)	
530W									531 (0.51)		531 (0.16)	

TABLE 7 (cont'd) ACREAGE AND PROPORTIONATE EXTENT OF EACH SOIL SLOPE PHASE BY RESOURCE AREA, OWNERSHIP, AND FOR THE ENTIRE DISTRICT

Map Symbol	Resource Area: Smith-Umpqua Public	Smith-Umpqua Private	Loon Lake Public	Loon Lake Private	Coos River Public	Coos River Private	Burnt Mtn. Public	Burnt Mtn. Private	Myrtlewood Public	Myrtlewood Private	Total Public	Total Private
	acres & percent	acres & percent	acres & percent	acres & percent	acres & percent	acres & percent	acres & percent	acres & percent	acres & percent	acres & percent	acres & percent	acres & percent
530X									4291 (4.09)		4291 (1.32)	
540W									249 (0.24)		249 (0.08)	
540X									1872 (1.78)		1872 (0.58)	
557W							10 (0.02)		1361 (1.30)	55 (0.11)	1371 (0.42)	55 (0.04)
557X							5 (0.01)		1687 (1.61)	23 (0.05)	1692 (0.52)	23 (0.02)
557Y									67 (0.06)		67 (0.02)	
564Y					455 (1.00)	196 (1.13)	650 (1.23)	358 (1.28)	373 (0.36)	338 (0.70)	1478 (0.45)	892 (0.69)
564Z					1063 (2.33)	478 (2.75)	1516 (2.88)	836 (2.99)	869 (0.83)	790 (1.64)	3448 (1.06)	2104 (1.63)
580W									657 (0.63)		657 (0.20)	
580X									1909 (1.82)		1909 (0.59)	
RW									580 (0.55)		580 (0.18)	
RX			49 (0.13)		999 (2.19)	416 (2.39)	1682 (3.19)	726 (2.59)	4286 (4.08)	732 (1.52)	7016 (2.16)	1874 (1.45)

TABLE 7 (cont'd) ACREAGE AND PROPORTIONATE EXTENT OF EACH SOIL SLOPE PHASE BY RESOURCE AREA, OWNERSHIP, AND FOR THE ENTIRE DISTRICT

Map Symbol	Resource Area: Smith-Umpqua Public	Smith-Umpqua Private	Loon Lake Public	Loon Lake Private	Coos River Public	Coos River Private	Burnt Mtn. Public	Burnt Mtn. Private	Myrtlewood Public	Myrtlewood Private	Total Public	Total Private
	acres & percent	acres & percent	acres & percent	acres & percent	acres & percent	acres & percent	acres & percent	acres & percent	acres & percent	acres & percent	acres & percent	acres & percent
RY	6020 (7.17)	2498 (10.45)	1635 (4.29)	390 3.26)	2258 (4.95)	839 (4.83)	2787 (5.29)	1497 (5.35)	3894 (3.71)	1849 (3.84)	16,594 (5.10)	7073 (5.46)
RZ	1365 (1.60)	700 (0.80)			708 (1.55)	305 (1.76)	1130 (2.14)	597 (2.13)	671 (0.64)	548 (1.14)	3009 (0.92)	1450 (1.12)
TOTALS	85,864	25,405	38,131	11,969	45,625	17,372	52,720	27,980	104,977	48,202	325,464	129,428

Productivity for Douglas fir on well-drained and moderately well-drained areas of alluvial land is high. Productivity for Douglas fir on somewhat poorly and poorly-drained areas of Alluvial Land is low. Productivity for western red cedar is high on the more poorly drained areas. Alluvial Land is usually moist and is dry between 4 and 12 inches for less than 45 consecutive days during the dry summer season.

Permeability is variable, but generally is moderate. Runoff is slow and the erosion hazard is slight. Special surface and/or subsurface drainage design is frequently required in the construction of stable roads located along areas of Alluvial Land.

Seedling mortality of Douglas fir is slight on the better-drained areas and severe on the poorer-drained areas. Compaction hazard is variable.

The limitation for winter grading may be severe because of a flood hazard. Alluvial Land generally is a poor source of material for the subgrade of roads due to low-bearing capacity and poor compaction characteristics.

Proper management of Alluvial Land usually includes the establishment and/or maintenance of buffer strip vegetation along stream banks to help maintain water quality and favorable water temperatures for salmonids. Some areas of Alluvial Land make suitable sites for nurseries or seed orchards.

Septic tank absorption fields, sanitary landfills and low buildings constructed on Alluvial Land have severe limitations due to the hazard of floods and poor drainage.

The land is well-suited for paths and trails and fairly well suited for campgrounds, picnic areas and playgrounds, if there is vegetative cover to control erosion and drainage is adequate.

The wildlife habitat suitability is generally good for woodland wildlife and poor for wetland wildlife. Alluvial Land often contains excellent elk wallows.

Mapping Unit:

I/V Alluvial Land, 0 to 10 percent slopes. 20,140 acres. Predominantly alluvial land on floodplains, alluvial fans and river tterraces. Included with alluvial land are minor areas of soils of the Blachly, Edson, Honeygrove, Jory, and Preacher soils on upland slopes adjacent to the floodplains and alluvial fans.

(10) Blachly Series

The Blachly series consists of very deep, red, clayey, well-drained soils developed in fine-textured colluvium from sedimentary and basic volcanic bedrock in areas having an annual precipitation of 60 to 100 inches. They occur on gently sloping broad ridges and steep slopes up to 50 percent in mountainous topography.

Profile Description: Blachly silty clay loam.

Surface Soil:	0-7"	Dark reddish brown, silty clay loam, friable, medium acid. 5 to 10 inches thick.
Subsoil:	7-80"	Dark red, clay, friable, medium acid. 55 to 140 inches thick.
Substratum:	80"+	Strongly weathered sandstone.
Representative Profile:		1000 feet north and 1500 feet west of SE corner of section 35, T.27S., R.12W.

Variations: Depth to bedrock ranges from 3 1/2 to 12 feet. The underlying bedrock is dominantly sandstone, but it may include other sedimentary rocks and basalt. Thickness of the solum ranges from 3 1/2 to 10 feet. Amount of rock fragments in the profile ranges from one to 15 percent in the upper part, and from 20 to 50 percent below 5 feet. Surface soil colors are dark brown, dark reddish brown, or very dark brown. Subsoil colors are dark red, red, reddish brown or yellowish red. Surface textures are silt loam, silty clay loam or clay loam. The texture of the subsoil is dominantly a clay with more than 50 percent clay.

Setting: Blachly soils occur on gently sloping broad ridges, moderately steep slump benches, and steep side slopes at elevations between 1,200 and 3,000 feet. Slope gradients range from 5 to 50 percent. The soils formed in fine textured colluvium from arkosic sandstone and other sedimentary rocks and basalt.

Blachly soils formed in a marine climate having an annual precipitation of 60 to 120 inches with a dry summer season, mean annual temperature of 52°F., an average January temperature of 43°F., and an average July temperature of 62°F. Blachly soils are usually moist and are dry between 4 and 12 inches for less than 45 consecutive days during the summer season. The native vegetation is a coniferous tree canopy dominanted by Douglas fir and hemlock, and an understory of vine maple, salal, red huckleberry, black huckleberry, Oregon grape and bracken fern.

The Blachly soils are associated with soils of the deep, fine-loamy, well-drained Preacher series; the moderately deep, fine-loamy, well-drained Bohannon soils; and the deep, fine-loamy, well-drained Slickrock soils.

The Blachly soils are finer textured in the subsoil than the soils of the Preacher, Bohannon and Slickrock soils. Slickrock soils have a surface soil thicker than 20 inches.

Soil Behavior: The Blachly soils are used for timber production, water supply purposes and by wildlife. The dominant trees are Douglas fir and alder with some western red hemlock at higher elevations.

Soil productivity for Douglas fir is high. Available water-holding capacity is high. The timber site class is usually II. The soils are usually moist and are dry between 4 and 12 inches for less than 45 consecutive days during the dry summer season. Figure 11 shows a typical Blachly-Preacher landscape and stand of Douglas fir timber.

Permeability is moderately slow. Overland flow is none, unless the surface vegetation has been disturbed and the soil has been compacted. Erosion hazard is slight on slopes of less than ten percent and moderate on slopes greater than ten percent. Cutbanks that exceed 15 feet in depth are generally unstable because of low shear strength.

Seedling mortality is slight. Plant competition from brush and alder is generally slight or moderate, but may be severe from bracken fern. The compaction hazard is severe. The limitation for grading in winter is severe because of the high plasticity when wet. Roads intended for use during wet weather should be surfaced. Slopes exceeding 35 percent are too steep for the safe operation of tractors. Blachly soils are poor sources of material for the subgrade of roads, because of low-bearing capacity and low compressibility. Roads need extra material for base stabilization and surfacing. Because of small slumps, maintenance needs are greater on slopes exceeding ten percent. Water bars are needed to prevent the accumulation of water and gullying along temporary roads and trails. The burning hazard for Blachly soils is slight.

Wildlife suitability is generally fair to poor for openland wildlife and good to fair for woodland wildlife. Blachly soils are very poor as potential habitat for wetland wildlife.

Mapping Units:

10/V Blachly silty clay loam, 0 to 10 percent slopes. 240 acres. Predominantly Blachly soils on broad ridgetops. Included with this soil are small areas of Honeygrove soils on ridgetops and Preacher and Bohannon soils along the edges of the ridgetops adjacent to the steeper sideslopes.

10/WV Blachly silty clay loam, 0 to 35 percent slopes. 890 acres. Predominantly Blachly soils on ridgetops and sideslopes. About 70 percent of the area has slope gradients of 10 to 35 percent, and 30 percent have slope gradients of 0 to 10 percent. Included with this soil are small areas of Honeygrove soils on the ridge tops, Preacher and Slickrock soils on slumpy benches, and Bohannon soils on headwalls and sideslopes.

Figure 11. Overview of Blachly (10) and Preacher (57) soilscape in Type II terrain. Ten year old second growth Douglas fir in left background and foreground. 15-30 year old second growth Douglas fir in right background; old growth Douglas fir stand in middle ground. Slater Creek.

10/W Blachly silty clay loam, 10 to 35 percent slopes. 5280 acres. Predominantly Blachly soils on narrow ridges and sideslopes. Included with this soil are small areas of Preacher and Slickrock soils on slump benches, and of Bohannon soils on head walls and sideslopes.

10/WX Blachly silty clay loam, 10 to 60 percent slopes. 5100 acres. Predominantly Blachly soils on ridgetops, rounded ridge noses and sideslopes. About 70 percent of the area has slope gradients of 10 to 35 percent, and 30 percent has slope gradients of 35 to 60 percent. Included with this soil are small areas of Preacher and Slickrock soils on slump benches and on sideslopes and of Bohannon soils on headwalls and on ridge noses.

10-57/WV Blachly silty clay loam - Preacher clay loam association, 0 to 35 percent slopes. 640 acres. This association consists of about 70 percent Blachly soils on broad ridge tops and about 30 percent preacher soils on somewhat steeper sideslopes. About 70 percent of the area has slope gradients of 10 to 35 percent, and about 30 percent has gradients of less than 10 percent. Included with these two soils are minor areas of Honeygrove soils on ridgetops and noses, and of Bohannon soils mixed with the Preacher soils on the sideslopes.

10-57/W Blachly silty clay loam - Preacher clay loam association, 10 to 35 percent slopes. 4580 acres. This association consists of about 70 percent Blachly soils on rounded ridgetops and saddles, and about 30 percent Preacher soils on narrow ridge tops and on sideslopes. Included with these two soils are minor areas of Bohannon soils on narrow crests and on sideslopes, and Honeygrove soils in the saddles.

10-57/WX Blachly silty clay loam - Preacher clay loam association, 10 to 60 percent slopes. 12,690 acres. This association consists of about 70 percent Blachly soils on rounded ridgetops and in saddles and about 30 percent Preacher soils on sideslopes, slump benches and on narrow ridgetops. About 70 percent of the slopes have gradients between 10 and 35 percent and 30 percent of the slopes have gradients between 35 and 60 percent. Included with these two soils are minor areas of Slickrock soils on slump benches and Bohannon soils on narrow ridges and the steeper sideslopes.

10-57/XW Blachly silty clay loam - Preacher clay loam association, 10 to 60 percent slopes. 4,060 acres. This association consists of about 70 percent Blachly soils on rounded ridgetops and saddles, and about 30 percent Preacher soils on sideslopes, slump benches and on narrow ridgetops. About 70 percent of the slopes have gradients between 35 and 60 percent, and about 30 percent have gradients between 10 and 35 percent. Included with these two soils are minor areas of Slickrock soils on slump benches, and Bohannon soils on narrow ridgetops and on the steeper hillsides.

10-57-63/XW Blachly silty clay loam - Preacher clay loam - Bohannon cobbly loam association, 10 to 60 percent slopes. 7000 acres. This association consists of about 40 percent Blachly soils on rounded ridgetops, 35 percent Preacher soils on slump benches and narrow ridgetops, and 25 percent Bohannon soils on relatively steep slump escarpments and on narrow ridgetops. About 70 percent of the slopes have gradients between 35 and 60 percent and 30 percent have gradients between 10 and 35 percent. Included with these soils are minor areas of Slickrock soils on slump benches and Digger soils on headwalls.

10-57-66/WX Blachly silty clay loam - Preacher clay loam - Digger cobbly loam association, 10 to 60 percent slopes. 760 acres. This consists of about 50 pecent Blachly soils on broad, rounded ridgetops, 30 percent Preacher soils on slump benches and narrow ridgetops, and 20 percent Digger soils on slump headwalls. About 70 percent of the slopes have gradients between 10 and 35 percent and 30 percent have gradients between 35 and 60 percent. Included with these three soils are minor amounts of Bohannon and Slickrock soils mingled with the Preacher and Digger soils at random.

10-66/X Blachly silty clay loam - Digger cobbly loam association 35 to 60 pecent slopes. 140 acres. This association consists of about 60 percent Blachly soils on ridge noses and in saddles, and about 40 percent Digger soils on narrow crests and on sideslopes. Included with these soils are minor areas of Preacher and Bohannon soils on sideslopes and Slickrock soils on slump benches.

(12) Jory Series

The Jory series consists of deep and very deep, red, clayey, well-drained soils formed in colluvium from basic igneous volcanic rocks and tuffaceous materials in areas having an annual precipitation of 40 to 60 inches. They occur on low rolling foothills and moderately steep slump benches with gradients of 2 to 50 percent.

Profile Description: Jory clay loam.

Surface Soil:	0-8"	Dark reddish brown, clay loam, friable, medium acid. 6 to 10 inches thick.
Subsoil:	8-72"	Dark reddish brown, clay, very firm, medium acid, strongly acid. 34 to 140 inches thick.
Substratum:	72"+	Hard basalt.

Representative Profile: NW 1/4, SE 1/4, section 11, T.22S., R.8W., North cutback of BLM road 22-8-10.0.

Variations: Depth to bedrock ranges from 3 1/2 to 12 feet. The underlying bedrock is dominantly basalt, but it may be tuffaceous materials and arkosic sandstone. Thickness of the solum ranges from 3 1/2 to 10 feet. The amount of coarse fragment ranges from none to 15 percent in the upper 3 or 5 feet and increasing to 50 percent below.

Surface soil colors are dark reddish brown or dark brown. Texture of the surface layer is clay loam, silty clay loam, or clay. Subsoil colors are dark red, dark reddish-brown, or yellowish-red. Subsoil texture is clay or silty clay. Stone lines may occur at varying depths from 2 to 12 feet.

Setting: Jory soils are on gently-sloping broad ridges, moderately-steep slump benches and steep ridge noses and sideslopes at elevations between 250 and 1,200 feet. Slope gradients range from 2 to 50 percent. The soils formed in deep, fine-textured colluvium derived from basic igneous and sedimentary rocks.

Jory soils formed in a humid temperature climate having an annual precipitation of 40 to 60 inches with a dry summer, a mean annual temperature of 52°F., an average January temperature of 43°F., and an average July temperature of 62°F. The average frost-free season is about 190 days. The Jory soils are usually moist, but are dry for 45 or more consecutive days between 4 and 12 inches in depth in most years. Native vegetation is composed of Douglas fir with scattered Oregon white oak. The understory is mixed shrubs and forbs, such as, sword fern, ocean spray, poison oak and rosebud.

The Jory soils are associated with soils of the moderately deep Nekia series, which is of very minor extent in the Coos Bay District and, therefore, was not mapped. Adjacent to the Jory soils, on more moist sites, are soils of the Honeygrove, Apt, Preacher and Bohannon series.

The Honeygrove soils are very similar to the Jory soils, except they are dry for less than 60 consecutive days between 4 and 12 inches. Apt soils are brown clayey soils that are also dry for shorter durations than the Jory soils. Preacher and Bohannon soils are less clayey than the Jory soils. They also are dry for shorter durations during the summer than the Jory soils.

Soil Behavior: The Jory soils are used for timber production, water supply purposes, home sites, recreation and by wildlife. The dominant trees are Douglas fir, Oregon white oak, big leaf maple and Grand fir.

Soil productivity for Douglas fir is medium to high. The timber site class is usually III. The soils are usually moist, but are dry between 4 and 12 inches for more than 45 consecutive days in 6 out of 10 years during the dry summer season.

Permeability is moderately slow. Overland flow is none, unless the surface vegetation has been disturbed and the soil has been compacted. Erosion hazard is slight on slopes of less than 10 percent and moderate on slopes greater than 10 percent. Cutbanks that exceed 15 feet in depth are generally unstable because of low shear strength and moderate shrink-swell.

Seedling mortality is moderate. Regeneration hazard is slight on slopes with north exposures and moderate on slopes with south exposures. Plant competition from brush and alder is generally moderate. Windthrow hazard is generally slight. Equipment limitations are severe on slopes exceeding 35 percent and because of the severe compaction hazard.

The limitations for grading in the winter are severe because of the high plasticity of the soils when wet. Jory soils are poor sources of material for the subgrade of roads due to their low-bearing capacity and low compressibility. Roads need extra material for base stabilization and surfacing. Because of small slumps, maintenance needs are greater on slopes exceeding 10 percent. Water bars are needed to prevent the accumulation of water from winter rains and to prevent gullying along temporary roads and trails. Surfacing is necessary on all-weather roads. Heliponds usually require linings to prevent seepage losses, due to moderate shrink-swell and poor compaction characteristics of the soil. However, Jory soils are suitable as helipond sites. The burning hazard for Jory soils is slight.

Wildlife suitability is generally good for open-land wildlife and woodland wildlife. Jory soils are very poor as potential habitat for wetland wildlife.

Mapping Units:

12/W Jory clay loam, 10 to 35 percent slopes. 260 acres. Predominantly Jory clay loam on broad benches and toeslopes. Included with this soil are small areas of unclassified moderately deep, clayey soils near slope breaks and on rounded ridge noses; and of unclassified deep, fine-loamy, xeric soils.

12/WX Jory clay loam, 10 to 60 percent slopes. 660 acres. Predominantly Jory clay loam on broad benches and toe slopes. About 70 percent of the areas have slope gradients between 10 and 35 percent, and 30 percent of the areas have gradients between 35 and 60 percent. Included with this soil are small areas of unclassified moderately deep clayey near slope breaks and on the steeper side slopes; and of unclassified, unmapped fine-loamy, xeric soils at random.

(14) Honeygrove Series

The Honeygrove series consists of deep and very deep red, clayey, well-drained soils developed in fine-textured colluvium from sedimentary and basic volcanic rocks in areas having an annual precipitation of 60 and 100 inches. They occur on gently-sloping broad ridges and sideslopes up to 50 percent in mountainous topography.

Profile Description: Honeygrove silty clay loam.

Surface Soil:	0-6"	Dark brown, silty clay loam, friable, medium acid. 4 to 10 inches thick.
Subsoil:	6-68"	Dark reddish brown, silty clay, firm, strongly acid. 36 to 140 inches thick.
Substratum	68"+	Weathered, fractured shale.

Representative Profile: Along BLM Road 22-8-18.0 in NE 1/4 Section 19 T.22S., R.8W.

Variations: Depth to bedrock ranges from 3 1/2 to 12 feet. Solum thickness ranges from 40 to 70 inches. The underlying bedrock is dominantly arkosic sandstone and shale, but it may include basalt. Content of rock fragments in the profile ranges from none to 10 percent in the upper part and increasing up to more than 50 percent below 4 feet. Surface colors are very dark brown, dark brown or dark reddish brown. Texture of the surface layer is silty clay loam, clay loam, or clay. Subsoil color is dark reddish brown, dark red, or yellowish red. Subsoil texture is silty clay or clay.

Setting: Honeygrove soils are on gently sloping broad ridges, moderately steep slump benches and steep side slopes at elevations between 200 and 1,200 feet. Slope gradients range from 2 to 50 percent. The soils formed in deep fine-textured colluvium from sedimentary and basaltic bedrock. The climate is marine with an annual precipitation between 60 and 100 inches and a dry season during the summer. The mean annual temperature is 52°F., the average January temperature is about 43°F., and the average July temperature is about 62°F. The average frost-free period is about 190 days. Native vegetation is composed of a coniferous tree canopy dominated by Douglas fir and hemlock. The understory is red alder, mixed shrubs and forbs, such as vine maple, salal, red huckleberry, black huckleberry, bracken fern, and Oregon grape.

The Honeygrove soils are associated with Apt. Bohannon, Digger, Preacher, Peavine and Slickrock soils. Apt soils are very similar to Honeygrove soils except for color, which is more brown for the Apt soils. The Bohannon and Digger soils occur on steeper slopes and are coarser-textured, and higher in coarse fragements, than Honeygrove soils. They are also moderately deep. Preacher and Slickrock soils are deep, but they are coarser-textured and browner than Honeygrove soils. Peavine soils are moderately deep equivalents of Honeygrove soils.

Soil Behavior: The Honeygrove soils are used for timber production, water supply purposes, home sites, recreation and by wildlife. The dominant trees are Douglas fir and western hemlock.

Soil productivity for Douglas fir is high. The timber site class is usually III+ or II. The available water holding capacity is high. The soils are usually moist and are dry between 4 and 12 inches for less than 45 consecutive days during the dry summer season.

Permeability is moderately slow. Overland flow is none, unless the surface vegetation has been removed and the soil has been compacted. Erosion hazard is slight on slopes of less than 10 percent and moderate on slopes greater than 10 percent. Cutbanks that exceed 15 feet in depth are generally unstable because of low shear strength.

Seedling mortality is slight. Plant competition from brush and alder is generally slight or moderate. Windthrow hazard is generally slight. The compaction hazard is severe. The limitation for grading in the winter is severe because of the high plasticity when wet. All-weather roads require surfacing. Slopes exceeding 35 percent are too steep for the safe operation of tractors. Honeygrove soils are poor sources of material for the subgrade of roads because of low bearing capacity and low compressibility. Roads need extra material for base stabilization and surfacing. Because of small slumps, maintenance needs are greater on slopes exceeding 10 percent. Water bars are needed to prevent the accumulation of water and to prevent gullying along temporary roads and trails. Heliponds usually require lining to prevent seepage losses, due to moderate shrink-swell and poor compaction characteristics of the soil. However, Honeygrove soils are suitable as helipond sites. The burning hazard for Honeygrove soils is slight.

Wildlife habitat suitability is generally poor or fair for open land wildlife and good or fair for woodland wildlife. Honeygrove soils are very poor as potential habitat for wetland wildlife.

Septic tank absorption fields and sanitary landfills constructed on Honeygrove soils have severe limitation.

Mapping Units:

14/W Honeygrove silty clay loam, 10 to 35 percent slopes. 3820 acres. Predominantly Honeygrove soils on rolling foothills and ridges. Included with this soil are small areas of Preacher and Peavine soils at random.

14/XW Honeygrove silty clay loam, 10 to 60 percent slopes. 8980 acres. Predominantly Honeygrove soils on ridgetops and side slopes. About 70 percent of the areas have slope gradients between 35 and 60 percent, and about 30 percent of the areas have slopes between 10 and 35 percent. Included with this soil are minor areas of Preacher soils on the rounded ridgetops and of Bohannon and Peavine soils on the steeper side slopes.

14-50/W Honeygrove silty clay loam - Apt clay loam association, 10 to 35 percent slopes. 430 acres. This association consists of about 70 percent Honeygrove soils and 30 percent Apt soils. The Apt soils generally occur on uneven slump benches and the Honeygrove soils on smooth ridgetops and side slopes. Included with these soils are small areas of Preacher and Bohannon soils mingled with the Apt soils, and of Peavine soils mingled with the Honeygrove soils.

14-50/XW Honeygrove silty clay loam - Apt clay loam association, 10 to 60 percent slopes. 2900 acres. This association consists of about 70 percent Honeygrove soils on smooth ridgetops and side slopes, and about 30 percent Apt soils on uneven slump benches. About 70 percent of the areas have gradients between 35 and 60 percent, and about 30 percent of the areas have gradients between 10 and 35 percent. Included with these soils are minor areas of Preacher, Bohannon and Digger soils mingled with the Apt soils and on headwalls of slumps, and of Peavine soils mingled with the Honeygrove soils on narrow ridgetops and ridge noses.

14-50/X Honeygrove silty clay loam - Apt clay loam association, 35 to 60 percent slopes. 370 acres. This association consists of about 60 percent Honeygrove soils on narrow ridgetops and smooth side slopes, and about 40 percent Apt soils on uneven side slopes and slump benches. Included with these soils are minor areas of Preacher, Bohannon and Digger soils mingled with the Apt soils and on headwalls of slumps, and of Peavine soils mingled with the Honeygrove soils.

14-57/WX Honeygrove silty clay loam - Preacher clay loam association, 10 to 60 percent slopes. 140 acres. This association consists of about 70 percent Honeygrove soils on broad rounded foothills and ridges, and about 30 percent Preacher soils on steeper side slopes. About 70 percent of the area has gradients of 10 to 35 percent and about 30 percent has gradients of 35 to 60 percent. Included with these soils are minor areas of Peavine and Apt soils mingled with the Honeygrove soils, and of Bohannon and Digger soils mingled with the Preacher soils.

14-57-66/XW Honeygrove silty clay loam - Preacher clay loam - Digger gravelly loam association, 10 to 60 percent slopes. 1360 acres. This association consists of about 40 percent Honeygrove soils, 35 percent Preacher soils, and 25 percent Digger soils. The Honeygrove soils are mostly on smooth broad ridgetops and saddles. The Preacher soils are on slump benches and on side slopes. The Digger soils are mostly on slump escarpments. About 70 percent of the area had gradients between 35 and 60 percent, and about 30 percent of the area has gradients between 10 and 35 percent. Included with these major soils are minor areas of Peavine soils mingled with the Honeygrove soils; Slickrock, Bohannon and Apt soils mingled with the Preacher soils; and Jason and Unit 166 soils mingled with the Digger soils.

14-57-66/X Honeygrove silty clay loam - Preacher clay loam - Digger gravelly loam association, 35 to 60 percent slopes. 970 acres. This association consists of about 40 percent Honeygrove soils, 35 percent Preacher soils, and 25 percent Digger soils. The Honeygrove soils are mostly on smooth ridgetops and saddles; the Preacher soils are mostly on slump benches and smooth sideslopes; and the Digger soils are mostly on headwalls of slumps. Included with the soils are minor aress of Peavine soils mingled with the Honeygrove soils; Bohannon, Slickrock and Apt soils mingled with the Preacher soils; and Jason and Unit 166 soils mingled with the Digger soils.

(50) Apt Series

The Apt series consists of deep and very deep, well-drained, brown, clayey soils developed in fine-textured colluvium from sedimentary and basic volcanic rocks in areas having an annual precipitation of 50 to 100 inches. They occur on uneven sideslopes in mountainous topography with gradients of 2 to 50 percent.

Profile Description: Apt clay loam.

Surface Soil:	0-12	Very dark grayish brown clay loam, very friable, medium acid. 10 to 15 inches thick.
Subsoil:	12-63"	Dark brown silty clay, firm, strongly acid. 30 to 60 inches thick.
Substratum:	63"+	Weathered, fractured shale.

Representative Profile: Along BLM road No. 22-8-17.0 in SW 1/4 Section 17, T. 22 S., R. 8 W.

Variations: Depth to bedrock ranges from 3 1/2 to 10 feet. Solum thickness ranges from 40 to 70 inches. Coarse fragment content ranges from none to 10 percent in the upper part, and up to 50 percent below 40 inches. Surface colors are dark brown, very dark grayish brown, or very dark brown. Texture of the surface layer is clay loam, silty clay loam, or clay. Subsoil colors are dark brown, brown, yellowish brown, dark yellowish brown, or strong brown. Texture of the subsoil is clay or silty clay. Drainage class is well-drained or moderately well-drained.

Setting: Apt soil occurs on uneven or complex slopes in mountainous topography. Many are on slump benches. Slopes are irregular with gradients ranging from 2 to 50 percent. The soils formed in fine-textured colluvium or landslide material from arkosic sandstone, shale, or basic igneous rocks. The soils occur at elevations from 200 to 1,500 feet. The climate is a moderate marine climate with

dry and warm summers; a mean annual temperature of 52°F.; an average January temperature of about 43°F.; and an average frost-free season is about 190 days. Native vegetation is composed of a coniferous tree canopy dominated by Douglas fir. The understory is mixed shrubs and forbs; such as, sword fern, ocean spray, hazel, scotch broom, and thimble berry.

The Apt soils are associated with soils of the Honeygrove, Bohannon, Digger, Peavine, Preacher, and Slickrock series. Honeygrove soils are red and, otherwise, very similar to Apt soils. Bohannon, Digger and Peavine soils are moderately deep. Bohannon and Digger soils are skeletal and coarser in texture than the Apt soils. Peavine soils are red clayey soils. Preacher and Slickrock soils are fine-loamy soils and the Slickrock soils have a surface layer more than 20 inches thick.

Soil Behavior: The Apt soils are used for timber production, water supply purposes, home sites, recreation, farming, and by wildlife. The dominant trees are Douglas fir and big leaf maple, with some western red cedar, hemlock and grand fir.

Soil productivity for Douglas fir is high. The timber site class is usually II. The available water holding capacity is high. The soils are usually moist and are dry between 4 and 12 inches for less than 45 consecutive days during the dry summer season.

Permeability is moderately slow. Overland flow is none or slight, unless the surface vegetation has been removed and the soils have been compacted. Erosion hazard is slight on slopes of less than 10 percent, moderate on slopes of 10 to 35 percent and severe on slopes that exceed 35 percent. Cutbanks that exceed 15 feet in depth are generally unstable, due to low shear strength.

Seedling mortality is slight. Plant competition from brush and alder is generally slight. The compaction hazard is severe. The limitation for grading in the winter is severe because of the high plasticity when wet. Slopes exceeding 35 percent are too steep for the safe operation of tractors. Apt soils are poor sources of material for the subgrade of roads because of low-bearing capacity and high shrink-swell capacity. Roads need extra material for base stabilization and surfacing. All-weather roads require surfacing. Due to the occurrence of small slipouts, maintenance needs are greater on slopes exceeding 10 percent. Water bars are needed to prevent the accumulation of water and to prevent gullying along temporary roads and trails. Apt soils on slopes exceeding 35 percent have severe hazards as helipond sites. The burning hazard for Apt soils is slight.

Wildlife habitat suitability is generally poor or fair for openland wildlife and good or fair for woodland wildlife. Apt soils are very poor as potential habitat for wetland wildlife.

Septic tank absorption fields and sanitary landfills constructed on Apt soils have severe limitations.

Mapping Units:

50-14/XW Apt clay loam - Honeygrove silty clay loam association, 10 to 60 percent slopes. 1690 acres. Deep, brown, clayey Apt soils make up about 60 percent of the area; and deep, red, clayey Honeygrove soils make up about 40 percent of the area. The Honeygrove soils are mostly on broad, rounded, stable ridgetops, and smooth upper sideslopes. The Apt soils are mostly on slump benches, and uneven lower sideslopes. About 70 percent of the slopes have gradients between 35 and 60 percent, and about 30 percent have gradients between 10 and 35 percent. Mingled with the Apt soils are minor inclusions of Slickrock and Preacher soils. Mingled with the Honeygrove soils are minor inclusions of Peavine and Blachly soils.

50-57-14/XW Apt clay loam - Preacher clay loam - Honeygrove silty clay loam association, 10 to 60 percent slopes. 340 acres. Deep, brown, clayey Apt soils make up about 40 percent of the area; deep, loamy Preacher soils make up about 35 percent of the area; and deep, red, clayey Honeygrove soils make up about 25 percent of the area. The Apt soils are mostly on slump benches and uneven toeslopes. The Preacher soils are mostly on steep sideslopes. The Honeygrove soils are mostly on rounded stable ridgetops. About 70 percent of the slopes have gradients between 35 and 60 percent, and about 30 percent have gradients between 10 and 35 percent. Mingled with the Apt soils are minor inclusions of Slickrock soils. Mingled with the Preacher soils are minor inclusions of Bohannon and Digger soils. Mingled with the Honeygrove soils are minor inclusions of Peavine soils.

50-63/YX Apt clay loam - Bohannon gravelly loam association, 35 to 80 percent slopes. 1,000 acres. This association consists of about 70 percent Apt soils on slump benches and about 30 percent Bohannon soils on slump escarpments and on very steep finger ridges. About 70 percent of the area has gradients between 60 and 80 percent, and about 30 percent has gradients between 35 and 60 percent. Included with these soils are minor areas of Preacher and Slickrock soils mingled with the Apt soils; and Digger, Jason and Unit 166 soils mingled with the Bohannon soils.

50-66-14/XW Apt clay loam - Digger gravelly loam - Honeygrove silty clay loam association, 10 to 60 percent slopes. 480 acres. Deep, brown, clayey Apt soils make up about 40 percent of the area; moderately deep, loamy-skeletal Digger soils make up about 35 percent of the area; and deep, red, clayey Honeygrove soils

make up about 25 percent of the area. The Apt soils are mostly on slump benches and uneven toeslopes. The Digger soils are mostly on slump escarpments and dissected steep slopes. The Honeygrove soils are mostly on rounded, stable ridgetops. About 70 percent of the slopes have gradients between 35 and 60 percent, and about 30 percent have gradients between 10 and 35 percent. Mingled with the Apt soils are minor inclusions of Slickrock and Preacher soils. Mingled with the Digger soils are minor inclusions of Bohannon, Jason and Unit 166 soils. Mingled with the Honeygrove soils are minor inclusions of Peavine soils.

(54) Slickrock Series

The Slickrock series consists of very deep, brown, thick surface layered, fine-loamy soils developed in colluvium from sedimentary rocks in areas having an annual precipitation of 60 to 120 inches. They occur on gently-sloping to steep mountainous uplands in the Coast Range.

Profile Description: Slickrock gravelly clay loam.

Surface soil:	0-22"	Very dark brown gravelly clay loam, friable, strongly acid. 20 to 28 inches.
Subsoil:	22-66"	Dark yellowish brown gravelly clay loam, friable, strongly acid. 30 to 50 inches thick.
Substratum	66"+	Strongly weathered sandstone.

Representative Profile: On the east side of BLM road 29-9-28.0 approximately 0.3 miles from the junction of BLM road 29-9-29.0 in the NE 1/4, NE 1/4, Section 29, T. 29 S., R. 9 W.

Variations: Depth to bedrock is 50 to over 60 inches. Amount of rock fragments ranges from 5 to 25 percent in the surface soil, and from 15 to 25 percent in the subsoil. The reaction is strongly acid or medium acid. The color of the surface soil is very dark brown, very dark grayish brown, or dark brown. The texture of the surface layer is gravelly clay loam, gravelly silt loam, loam or silt loam. The color of the subsoil is dark yellowish brown, yellowish brown, or strong brown. The texture of the subsoil is gravelly light clay loam or gravelly light silty clay loam.

Setting: Slickrock soils occur on gently sloping to steep slump benches, uneven toeslopes, and sideslopes at elevations between 250 and 3,000 feet. Slope gradients are mostly between 10 and 60 percent. The soil formed in colluvium and residuum from arkosic sandstone and other sedimentary rocks. Slickrock soils formed in a marine climate having an annual precipitation of 60 to 120 inches with a dry summer season less than 45 days long. The mean annual temperature is about 52°F.; the

average January temperature is about 43°F.; and the average July temperature is about 62°F. Slickrock soils are usually moist and are dry between 4 and 12 inches for less than 45 consecutive days during the summer season. The average frost-free season is about 190 days. The native vegetation is a coniferous tree canopy dominated by Douglas fir and western hemlock, and an understory of vine maple, salal, red huckleberry, Oregon grape and sword fern.

Slickrock soils are associated with the deep, thin surface-layered, fine-loamy Preacher soils; the moderately deep, fine-loamy Bohannon soils; the deep, brown, clayey Apt soils; and the deep, red, clayey Blachly soils.

Soil Behavior: The Slickrock soils are used for timber production, water supply purposes and by wildlife. The dominant trees are western hemlock, Douglas fir and red alder.

Soil productivity for Douglas fir is high. The timber site class is Usually II. The available water-holding capacity is high. The soils are usually moist and are dry between 4 and 12 inches for less than 45 consecutive days during the dry summer season.

Permeability is moderate. Runoff is medium to rapid, when surface vegetation has been removed. Erosion hazard is slight on slopes less than 10 percent, moderate on slopes of 10 to 35 percent, and severe on slopes that exceed 35 percent. Cutbanks that exceed 10 feet in depth are generally unstable, due to low shear strength and severe piping hazard.

Seedling mortality is slight. Plant competition from brush and alder is generally moderate, except on slopes less than 35 percent, which is severe. The windthrow hazard is slight. The compaction hazard is moderate. Slumping and sliding hazards are severe on slopes that exceed 35 percent. Road maintenance is expensive because of numerous drainages and uneven microrelief. Slopes that exceed 35 percent are too steep for the safe operation of tractors. Slickrock soils are poor sources of material for the subgrade of roads because of low-bearing capacity, low compressibility and poor resistance to piping. Water bars are needed to prevent the accumulation of water and to prevent gullying along temporary roads and trails. Constructed heliponds require linings to prevent excessive seepage losses, due to slope and moderate permeability. The burning hazard for Slickrock soils is slight.

Wildlife habitat suitability is generally fair to poor for openland wildlife and good to fair for woodland wildlife. Slickrock soils are very poor as potential habitat for wetland wildlife.

Mapping Units: Slickrock soils are not dominant in any of the mapping units. They do occur as secondary members, tertiary members or inclusions in mapping units of the Blachly, Apt, Preacher, and Bohannon series.

(57) Preacher Series

The Preacher series consists of deep, brown, loamy, well-drained soils developed in colluvium from sedimentay rocks in areas having an annual precipitation of 60 to 120 inches. They occur on gently to steeply sloping mountainous uplands at elevations of 250 to 3,000 feet.

Profile Description: Preacher clay loam.

Surface Soil:	0-14"	Dark brown clay loam, friable, strongly acid. 8 to 18 inches thick.
Subsoil:	14-44"	Dark yellowish brown clay loam, friable, strongly acid. 26 to 50 inches thick.
Substratum:	44"+	Strongly weathered sandstone.

Representative Profile: NW 1/4 of Section 27, T. 25 S., R. 10 W. On south side of Weyerhaeuser Co. 5000 road. Located in University of Washington Regional Forest Fertilization plots.

Variations: Depth to bedrock is 40 to over 60 inches. Amount of rock fragments ranges from one to 15 percent in the upper part of the profile, and increases to from 20 to 50 percent below 40 inches. Surface soil color is very dark brown, very dark grayish brown, or dark brown. The texture is clay loam or silt loam. Subsoil color is dark yellowish brown, yellowish brown, or strong brown. The texture is clay loam or silt loam.

Setting: Preacher soils occur on gently sloping ridge tops, moderately steep slump benches, and steep side slopes at elevations between 250 and 3,000 feet. Slope gradients range from 5 to 70 percent. The soils formed in medium-textured colluvium from arkosic sandstone and other sedimentary rocks. A typical Preacher-Blachly soilscape is shown in Figure 12.

Preacher soils formed in a marine climate having an annual precipitation of 60 to 120 inches with a dry summer season, a mean annual temperature of 52°F. and an average July temperature of 62°F. Preacher soils are usually moist and are dry between depths of 4 and 12 inches for less than 45 consecutive days during the summer season. The average frost-free season is about 190 days. The native vegetation is a coniferous tree canopy dominated by Douglas fir and hemlock, and an understory of vine maple, salal, red huckleberry, Oregon grape and bracken fern.

Preacher soils are associated with the moderately deep, fine-loamy Bohannon soils; the deep, thick surfaced, fine-loamy Slickrock soils; the moderately deep, loamy-skeletal Digger soils; the deep, brown, clayey Apt soils; and the deep, red, clayey Blachly soils.

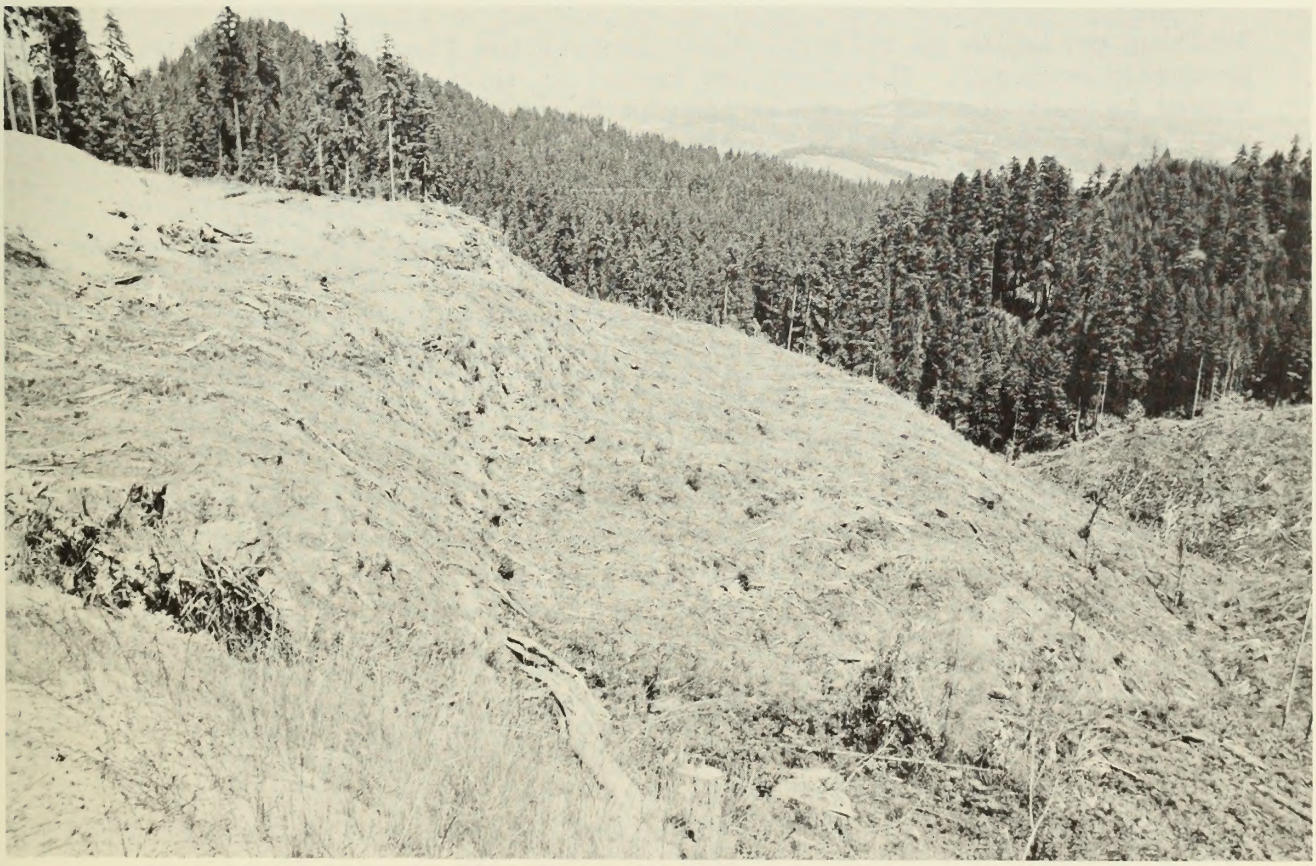

Figure 12. Typical Preacher-Blachly soilscape. Preacher soils are on slump bench in middle ground, and Blachly soils are on ridge crest with landing in left background. These soils support Site III Douglas fir in the Coos Bay District.

Soil Behavior:

The Preacher soils are used for timber production, water supply, recreation and by wildlife. The dominant trees are Douglas fir, western hemlock, western red cedar, alder and big-leaf maple.

Soil productivity for Douglas fir is high. The timber site class is usually II. The available water-holding capacity is high. The soils are usually moist and are dry between 4 and 12 inches for less than 45 consecutive days during the dry summer season.

Permeability is moderate. Run-off is medium to rapid when surface vegetation has been removed. Erosion hazard is slight on slopes less than 10 percent, moderate on 10 to 35 percent slopes, and severe on slopes that exceed 35 percent. Cutbanks that exceed 15 feet in depth are generally unstable, due to low shear strength.

Seedling mortality is slight. Plant competition from brush and alder is generally moderate. The windthrow hazard is slight. The compaction hazard is moderate. Most roads require frequent maintenance of culverts and road fills. Preacher soils are poor sources of material for the subgrade of roads because of low-bearing capacity. Along temporary roads and trails, water bars are needed to prevent the accumulation of water. Constructed heliponds require lining to prevent excessive seepage losses due to slope and moderate permeability. The burning hazard for Preacher soils is slight.

Wildlife habitat suitability is generally poor for openland wildlife and good for woodland wildlife. Preacher soils are very poor as potential habitat for wetland wildlife.

Preacher soils on slopes of less than 10 percent have moderate limitations as sites for septic tank absorption fields and sanitary landfills.

Mapping Units:

57/W Preacher clay loam, 10 to 35 percent slopes. 9150 acres. Predominantly deep, loamy Preacher soils on rolling topography. The Preacher soils are mostly on rounded broad ridgetops and smooth steep sideslopes. Mingled with the Preacher soils are minor inclusions of deep, red, clayey Blachly soils on broad ridgetops; and of moderately deep, loamy Bohannon soils on the sideslopes and narrow ridge crests.

57B/W Preacher bouldery clay loam, 10 to 35 percent slopes. 530 acres. Predominantly deep, bouldery Preacher soils on undulating to rolling slump deposits at the west end of Ancient Sitkum Lake. Many of the rock fragments are huge boulders. Mingled with the Preacher soils are minor inclusions of Slickrock soils and rubble land.

57/X Preacher clay loam, 35 to 60 percent slopes. 2620 acres. This mapping unit is predominantly deep, loamy Preacher soils on ridgetops, steep sideslopes, and slump benches. Mingled with the Preacher soils are minor inclusions of Blachly and Peavine soils on the ridgetops, of Apt and Slickrock soils on the slump benches, and of Bohannon soils on the sideslopes.

57B/X Preacher bouldery clay loam, 35 to 60 percent slopes. 260 acres. Predominantly deep, bouldery Preacher soils on rolling to steep slump deposits at the west end of Ancient Sitkum Lake. Many of the rock fragments are huge bounders. Mingled with the Preacher soils are minor inclusions of Slickrock soils and rubble land.

57-10/W Preacher clay loam - Blachly silty clay loam association, 10 to 35 percent slopes. 4490 acres. Deep loamy Preacher soils make up about 65 percent of the area, and deep, red, clayey Blachly soils make up about 35 percent of the area. The Preacher soils are mostly on the sideslopes, and the Blachly soils are mostly on the broad-rounded ridgetops. Mingled with the Preacher soils are minor inclusions of moderately deep Bohannon and loamy-skeletal Digger soils. Mingled with the Blachly soils are minor inclusions of clayey Honegrove soils with a strongly developed subsoil.

57-10/WX Preacher clay loam - Blachly silty clay loam association, 10 to 60 percent slopes. 11,140 acres. Deep, loamy Preacher soils make up about 65 percent of the area, and deep, red, clayey Blachly soils make up about 35 percent of the area. The Preacher soils are mostly on the steep sideslopes and narrow ridgetops. The Blachly soils are mostly on broad ridgetops and slump benches. About 70 percent of the area has slope gradients between 10 and 35 percent, and the remaining 30 percent has gradients between 35 and 60 percent. Mingled with the Preacher soils are minor inclusions of moderately deep Bohannon soils, and loamy-skeletal Digger soils on the sideslopes and narrow ridgetops, and of Slickrock soils in the basins of slump benches. Mingled with the Blachly soils are minor inclusions of the strongly developed, red, clayey Honegrove soils.

57-10/XW Preacher clay loam - Blachly silty clay loam association, 10 to 60 percent slopes. 8240 acres. Deep, loamy Preacher soils make up about 65 percent of the area, and deep red, clayey Blachly soils make up about 35 percent of the area. The Preacher soils are mostly on the steep sideslopes, uneven toeslopes and narrow ridgetops. The Blachly soils are mostly on broad ridgetops and even upper sideslopes. About 70

percent of the area has slope gradients of 35 to 60 percent, and the remaining 30 percent has gradients between 10 and 35 percent. Mingled with the Preacher soils are minor inclusions of moderately deep Bohannon soils, and loamy-skeletal Digger soils on the sideslopes and narrow ridgetops, and of Slickrock soils on the slump benches. Mingled with the Blachly soils are minor inclusions of the strongly-developed, red clayey Honeygrove soils.

57-10/X Preacher clay loam - Blachly silty clay loam association, 35 to 60 percent slopes. 1930 acres. Deep loamy Preacher soils make up about 65 percent of the area, and deep clayey Blachly soils make up about 35 percent of the area. The Preacher soils are mostly on the steep sidelsopes, uneven slump benches, and narrow ridgetops. The Blachly soils are mostly on broad ridgetops, in saddles, on ridge noses, and on even upper sideslopes. Mingled with the Preacher soils are minor inclusions of moderately deep Bohannon soils, and loamy-skeletal Digger soils on the sideslopes and ridge tops, and of Slickrock soils on the slump benches. Mingled with the Blachly soils are minor inclusions of the strongly developed Honeygrove soils.

57-10/YX Preacher clay loam - Blachly silty clay loam association, 35 to 80 percent slopes. 300 acres. Deep loamy Preacher soils make up about 65 percent of the area and deep clayey Blachly soils make up about 35 percent of the area. The Preacher soils are mostly on the steep and very steep sideslopes. The Blachly soils are mostly on rounded ridgetops, ridge noses, and smooth upper sideslopes. About 70 percent of the area has slope gradients between 60 and 80 percent, and about 30 percent has gradients between 35 and 60 percent. Mingled with the Preacher soils are minor inclusions of the moderately deep Bohannon soils, the loamy-skeletal Digger soils, and the shallow loamy-skeletal Jason and Umpcoos soils. Mingled with the Blachly soils are minor inclusions of the well-developed Honeygrove soils.

57-10-54/X Preacher clay loam - Blachly silty clay loam - Slickrock gravelly clay loam association, 35 to 60 percent slopes. 790 acres. Deep loamy Preacher soils make up about 50 percent of the area; deep clayey Blachly soils make up about 30 percent of the area; and deep, thick surface layered Slickrock soils make up about 20 percent of the area. The Preacher soils are mostly on steep sideslopes; the Blachly soils are mostly on rounded ridgetops, and the Slickrock soils are mostly on uneven toeslopes and slump benches. Mingled with the Preacher soils are minor inclusions of moderately deep Bohannon soils and loamy-skeletal Digger soils. Minor inclusions of Honeygrove soils are mingled with the Blachly soils. Minor inclusions of brown clayey Apt soils are mingled with the Slickrock soils.

57-10-63/WX Preacher clay loam - Blachly silty clay loam - Bohannon gravelly loam association, 10 to 60 percent slopes. 980 acres. Deep, loamy Preacher soils make up about 50 percent of the area; deep, clayey Blachly soils make up about 30 percent of the area; and moderately deep loamy Bohannon soils make up about 20 percent of the area. The Preacher soils are mostly on sideslopes and slump benches. The Blachly soils are mostly on rounded ridgetops. The Bohannon soils are mostly on the steeper sideslopes and along slope breaks. About 70 percent of the area has slope gradients between 10 and 35 percent, and the remaining 30 percent has gradients between 35 and 60 percent. Mingled with the Preacher soils are minor inclusions of Slickrock soils. Mingled with the Blachly soils are minor inclusions of Honeygrove soils. Mingled with the Bohannon soils are minor inclusions of Digger, Umpcoos and Jason soils.

57-10-63/XW Preacher clay loam - Blachly silty clay loam - Bohannon gravelly loam association, 10 to 60 percent slopes. 5890 acres. Deep loamy Preacher soils make up about 50 percent of the area; deep, clayey Blachly soils make up about 30 percent of the area; and moderately deep, loamy Bohannon soils make up about 20 percent of the area. The Preacher soils are mostly on smooth sideslopes and uneven slump benches. The Blachly soils are mostly on rounded ridgetops. The Bohannon soils are mostly on the steeper dissected sideslopes and along slope breaks. About 70 percent of the area has slope gradients between 35 and 60 percent, and the remaining 30 percent has gradients between 10 and 35 percent. Mingled with the Preacher soils are minor inclusions of Slickrock soils. Mingled with the Blachly soils are minor inclusions of Honeygrove soils. Mingled with the Bohannon soils are minor inclusions of Digger, Umpcoos and Jason soils.

57-10-63/X Preacher clay loam - Blachly silty clay loam - Bohannon gravelly loam association, 35 to 60 percent slopes. 11,050 acres. Deep, loamy Preacher soils make up about 50 percent of the area; deep, clayey Blachly soils make up about 30 percent of the area; and moderately deep, loamy Bohannon soils make up about 20 percen of the area. The Preacher soils are mostly on smooth sideslopes and uneven slump benches. The Blachly soils are mostly on rounded ridgetops. The Bohannon soils are mostly on the steeper dissected sideslopes and along slope breaks. Mingled with the Preacher soils are minor inclusions of Slickrock soils. Mingled with the Bohannon soils are minor inclusions of Digger, Umpcoos and Jason soils.

57-10-63/XY Preacher clay loam - Blachly silty clay loam - Bohannon gravelly loam association, 35 to 80 percent slopes. 730 acres. Deep, loamy Preacher soils make up about 50 percent of

the area; deep, clayey Blachly soils make up about 30 percent of the area; and moderately deep, loamy Bohannon soils make up about 20 percent of the area. The Preacher soils are mostly on the steep side slopes and narrow ridgetops. The Blachly soils are mainly on rounded ridgetops, ridge noses and in saddles. The Bohannon soils are mostly on very steep sideslopes. About 70 percent of the area has slope gradients between 35 and 60 percent, and about 30 percent has gradients between 60 and 80 pecent. Mingled with the Preacher soils are minor inclusions of Slickrock soils. Mingled with the Blachly soils are minor inclusions of Honeygrove soils. Mingled with the Bohannon soils are minor inclusions of Digger, Umpcoos and Jason soils.

57-10-66/WX Preacher clay loam - Blachly silty clay loam - Digger gravelly loam association, 10 to 60 percent slopes. 4340 acres. Deep loamy Preacher soils make up about 50 percent of the area; deep clayey Blachly soils make up about 30 percent of the area; and moderately deep, loamy-skeletal Digger soils make up about 20 percent of the area. The Preacher soils are mostly on steep, smooth sideslopes and slump benches. The Blachly soils are mostly on rounded ridgetops and ridge noses. The Digger soils are mostly on dissected steep slopes and on back slopes of slumps. About 70 percent of the area has slope gradients between 10 and 35 percent, and the remaining 30 percent has gradients of 35 to 60 percent. Mingled with the Preacher soils are minor inclusions of Bohannon and Slickrock soils. Minor inclusions of Honeygrove soils are mingled with the Blachly soils, and minor amounts of Jason soils are mingled with the Digger soils.

57-14/W Preacher clay loam - Honeygrove silty clay loam association, 10 to 35 percent slopes. 210 acres. Deep loamy Preacher soils make up about 65 percent of the area, and deep, red, Honeygrove soils make up about 35 percent of the area. The Preacher soils are mostly on narrow ridge crests. The Honeygrove soils are mostly on broad-rounded ridgetops and on ridge noses. Mingled with the Preacher soils are minor inclusions of Bohannon and Digger soils. Mingled with the Honeygrove soils are minor inclusions of Blachly soils.

57-14/XW Preacher clay loam - Honeygrove silty clay loam association, 10 to 65 percent slopes. 270 acres. Deep, loamy, Preacher soils make up about 65 percent of the area, and deep, red, clayey Honeygrove soils make up about 35 percent of the area. The Preacher soils are mostly on the steep sideslopes and on narrow ridge crests. The Honeygrove soils are mostly on broad-rounded ridgetops and on ridge noses. About 70 percent of the area has slope gradients of 35 to 60 percent and the remaining 30 percent has gradients of 10 to 35 percent.

Mingled with the Preacher soils are minor inclusions of Bohannon and Digger soils. Mingled with the Honeygrove soils are minor inclusions of Blachly and Peavine soils.

57-14-50/W Preacher clay loam - Honeygrove silty clay loam - Apt clay loam association 10 to 35 percent slopes. 520 acres. Deep loamy Preacher soils make up about 40 percent of the area; deep red clayey Honeygrove soils make up about 35 percent of the area; and deep brown clayey Apt soils make up about 25 percent of the area. The Preacher soils are mostly on the steeper sideslopes of ridges. The Honeygrove soils are mostly on broad rounded ridgetops. The Apt soils are mostly on the lower uneven toe slopes and on slump benches. About 70 percent of the slopes have gradients between 10 and 35 percent, and about 30 percent have gradients between 35 and 60 percent. Mingled with the Preacher soils are minor inclusions of Bohannon and Digger soils. Mingled with the Honeygrove soils are minor inclusions of Blachly soils. Mingled with the Apt soils are minor inclusions of Slickrock soils.

57-14-63/XW Preacher clay loam - Honeygrove silty clay loam - Bohannon gravelly clay loam association, 10 to 60 percent slopes. 710 acres. Deep, loamy Preacher soils make up about 40 percent of the area; deep clayey Honeygrove soils make up about 35 percent of the area; and moderately deep, loamy Bohannon soils make up about 25 percent of the area. The Preacher soils are mostly on smooth sideslopes, slump benches and narrow ridgetops. The Honeygrove soils are mostly on broad-rounded ridgetops. The Bohannon soils are mostly on the steeper dissected sideslopes and along slope breaks. About 70 percent of the slopes have gradients between 35 and 60 percent, and about 10 percent have gradients between 10 and 35 percent. Mingled with the Preacher and Bohannon soils are minor inclusions of Slickrock and Digger soils. Mingled with the Honeygrove soils are minor inclusions of Blachly soils.

57-14-63/X Preacher clay loam - Honeygrove silty clay loam - Bohannon gravelly clay loam association, 35 to 60 percent slopes. 1970 acres. Deep, loamy Preacher soils make up about 40 percent of the area; deep, clayey Honeygrove soils make up about 35 percent of the area; and moderately deep Bohannon soils make up about 25 percent of the area. The Preacher soils are mostly on smooth sideslopes, slump benches, and narrow ridgetops. The Honeygrove soils are mostly on broad-rounded ridgeslopes. The Bohannon soils are mostly on the steeper dissected sideslopes and along slope breaks. Mingled with the Preacher and Bohannon soils are inclusions of Slickrock and Digger soils. Mingled with the Honeygrove soils are minor inclusions of Blachly soils.

57-50/W Preacher clay loam - Apt clay loam association, 10 to 35 percent slopes. 200 acres. Deep, loamy Preacher soils make up about 60 percent of the area, and deep, brown, clayey Apt soils make up about 40 percent of the area. The Preacher soils are mostly on ridgetops and the upper sideslopes. The Apt soils are mostly on uneven sideslopes and slump benches. Mingled with the Preacher soils are minor inclusions of Bohannon soils. Mingled with the Apt soils are minor inclusions of Slickrock soils.

57-50/X Preacher clay loam - Apt clay loam association, 35 to 60 percent slopes. 410 acres. Deep, loamy Preacher soils make up about 60 percent of the area, and deep, brown, clayey Apt soils make up about 40 percent of the area. The Preacher soils are mostly on ridgetops and the upper sideslopes. The Apt soils are mostly on uneven sideslopes and slump benches. Mingled with the Preacher soils are minor inclusions of Bohannon and Digger soils. Mingled with the Apt soils are minor inclusions of Slickrock soils.

57-50-14/WX Preacher clay loam - Apt clay loam - Honeygrove silty clay loam association, 10 to 60 percent slopes. 520 acres. Deep, loamy Preacher soils make up about 50 percent of the area; deep, brown, clayey Apt soils make up about 30 percent of the area; and deep, red, clayey Honeygrove soils make up about 20 percent of the area. The Preacher soils are mostly on the steep sideslopes and narrow ridgetops. The Apt soils are mostly on slump benches and uneven, lower sideslopes. The Honeygrove soils are mostly on broad-rounded ridgetops. About 70 percent of the slopes have gradients between 10 and 35 percent, and about 30 percent have gradients between 35 and 60 percent. Mingled with the Preacher soils are minor inclusions of Bohannon soils. Mingled with the Apt soils are minor inclusions of Slickrock soils. Mingled with the Honeygrove soils are minor inclusions of Peavine and Blachly soils.

57-50-14/X Preacher clay loam - Apt clay loam - Honeygrove silty clay loam association, 35 to 60 percent slopes. 140 acres. Deep, loamy Preacher soils make up about 50 percent of the area; deep, brown, clayey Apt soils make up about 30 percent of the area, and deep, red, clayey Honeygrove soils make up about 20 percent of the area. The Preacher soils are mostly on the steeper sideslopes and narrow ridgetops. The Apt soils are mostly on slump benches and uneven lower sideslopes. The Honeygrove soils are mostly on broad-rounded ridgetops. Mingled with the Preacher soils are minor inclusions of Bohannon soils. Mingled with the Apt soils are minor inclusions of Slickrock soils. Mingled with the Honeygrove soils are minor inclusions of Blachly soils.

57-54/XW Preacher clay loam - Slickrock gravelly loam association, 10 to 60 percent slopes. 2140 acres. Deep Preacher soils make up about 70 percent of the area; and deep, thick surfaced Slickrock soils make up about 30 percent of the area. The Preacher soils are mostly on the ridgetops and upper sideslopes. The Slickrock soils are mostly on slump benches and on uneven toeslopes. About 70 percent of the area has gradients between 35 and 60 percent, and about 30 percent has gradients between 10 and 35 percent. Mingled with the Preacher soils are minor inclusions of Blachly, Bohannon and Digger soils. Mingled with the Slickrock are minor inclusions of Apt soils.

57-54/X Preacher clay loam - Slickrock gravelly loam association, 35 to 60 percent slopes. 1600 acres. Deep, loamy Preacher soils make up about 70 percent of the area and deep, thick surfaced Slickrock soils, make up about 30 percent of the area. The Preacher soils are mostly on ridgetops and upper smooth sideslopes. The Slickrock soils are mostly on slump benches and on uneven toeslopes. Mingled with the Preacher soils are minor inclusions of Blachly, Bohannon and Digger soils. Mingled with the Slickrock soils are minor inclusions of Apt soils.

57-63/W Preacher clay loam - Bohannon gravelly loam association, 10 to 35 percent slopes. 540 acres. Deep, loamy Preacher soils make up about 60 percent of the area; and moderately deep loamy Bohannon soils make up about 40 percent of the area. The Preacher soils are mostly on the ridgetops and slump benches. The Bohannon soils are mostly on the steeper sideslopes. Mingled with the Preacher soils are minor inclusions of Blachly and Slickrock soils. Mingled with the Bohannon soils are minor inclusions of Digger soils.

57-63/XW Preacher clay loam - Bohannon gravelly loam association, 10 to 60 percent slopes. 13,240 acres. Deep, loamy Preacher soils make up about 60 percent of the area; and moderately deep, loamy Bohannon soils make up about 40 percent of the area. The Preacher soils are mostly on ridgetops and slump benches. The Bohannon soils are mostly on the steep sideslopes. About 70 percent of the slopes have gradients between 35 and 60 percent. Mingled with the Preacher soils are minor inclusions of Blachly and Slickrock soils. Mingled with the Bohannon soils are minor inclusions of Digger soils.

57-63/YX Preacher clay loam - Bohannon gravelly loam association, 35 to 80 percent slopes. 3640 acres. Deep, loamy Preacher soils make up about 65 percent of the area; and moderately deep, loamy Bohannon soils make up about 35 percent of the area. The Preacher soils are mostly on ridgetops and slump benches. The Bohannon soils are mostly on steep and very steep sideslopes. About 70 percent of the slopes have gradients between 60 and

80 percent, and about 30 percent have gradients between 35 and 60 percent. Mingled with the Preacher soils are minor inclusions of Blachly and Slickrock soils. Mingled with the Bohannon soils are minor inclusions of Digger and Jason soils.

57-63-10/WX Preacher clay loam - Bohannon gravelly loam - Blachly silty clay loam association, 10 to 60 percent slopes. 4520 acres. Deep, loamy Preacher soils make up about 40 percent of the area; moderately deep, loamy Bohannon soils make up about 35 percent of the area; and deep, clayey Blachly soils make up about 25 percent of the area. The Preacher soils are mostly on narrow ridgetops, smooth sideslopes and slump benches. The Bohannon soils are mostly on steep sideslopes. The Blachly soils are mostly on broad ridgetops and ridge noses. About 70 percent of the area has gradients between 10 and 35 percent, and about 30 percent has gradients between 35 and 60 percent. Mingled with the Preacher soils are minor inclusions of Slickrock soils. Mingled with the Bohannon soils are minor inclusions of Digger soils. Mingled with the Blachly soils are minor inclusions of Honeygrove soils.

57-63-10/X Preacher clay loam - Bohannon gravelly loam - Blachly silty clay loam association, 35 to 60 percent slopes. 640 acres. Deep, loamy Preacher soils make up about 40 percent of the area; moderately deep, loamy Bohannon soils make up about 35 percent of the area; and deep clayey Blachly soils make up about 25 percent of the area. The Preacher soils are mostly on narrow ridgetops, smooth sideslopes, and slump benches. The Bohannon soils are mostly on the steeper sideslopes. The Blachly soils are mostly on broad ridgetops and ridge noses. Mingled with the Preacher soils are minor inclusions of Digger soils. Mingled with the Blachly soils are minor inclusions of Honeygrove soils.

57-63-10/XY Preacher clay loam - Bohannon gravelly loam - Blachly silty gravelly loam, 35 to 80 percent slopes. 2920 acres. Deep, loamy Preacher soils make up about 40 percent of the area; moderately deep, loamy Bohannon soils make up about 35 percent of the area; and deep, clayey Blachly soils make up about 25 percent of the area. The Preacher soils are mostly on narrow ridgetops, smooth sideslopes, and slump benches. The Bohannon soils are mostly on the steeper sideslopes. The Blachly soils are mostly on broad ridgetops and ridge noses. About 70 percent of the slopes have gradients between 35 and 60 percent, and about 30 percent have gradients between 60 and 80 percent. Mingled with the Preacher soils are minor inclusions of Slickrock soils. Mingled with the Bohannon soils are minor inclusions of Digger and Jason soils. Mingled with the Blachly soils are minor inclusions of Honeygrove soils.

57-63-64/X Preacher clay loam - Bohannon gravelly clay loam - Jason gravelly loam association, 35 to 60 percent slopes. 220 acres. Deep, laomy Preacher soils make up about 50 percent of the area; moderately deep, loamy Bohannon soils make up about 30 percent of the area; and shallow loamy-skeletal Jason soils make up about 20 percent of the area. The Preacher soils are mostly on the ridgetops and smooth sideslopes. The Bohannon and Jason soils are mostly on the steeper sideslopes. Mingled with the Preacher soils are minor inclusions of Blachly soils. Mingled with the Bohannon and Jason soils are minor inclusions of Digger soils.

57-63-64/XY Preacher clay loam - Bohannon gravelly loam - Jason gravelly loam association, 35 to 80 percent slopes. 740 acres. Deep, loamy Preacher soils make up about 50 percent of the area; moderately deep, Bohannon soils make up about 30 percent of the area; and shallow loamy-skeletal Jason soils make up about 20 percent of the area. The Preacher soils are mostly on the ridgetops, smooth sideslopes and on slump benches. The Bohannon soils are mostly on steep sideslopes. The Jason soils are mostly on very steep sideslopes. About 70 percent of the area has slope gradients between 35 and 60 percent, and the remaining 30 percent has gradients between 65 and 80 percent. Mingled with the Preacher soils are minor inclusions of Blachly soils on the ridgetops, and of Slickrock soils on the slump benches. Mingled with the Bohannon soils are minor inclusions of Digger soils. Mingled with the Jason soils are minor inclusions of Umpcoos soils and Rock land.

57-66/W Preacher clay loam - Digger gravelly loam association, 10 to 35 percent slopes. 3190 acres. Deep, loamy Preacher soils make up about 65 percent of the area; and moderately deep loamy-skeletal Digger soils make up about 35 percent of the area. The Preacher soils are mostly on ridgetops and the Digger soils are mostly on the sideslopes. Mingled with the Preacher soils are minor inclusions of Blachly soils. Mingled with the Digger soils are minor inclusions of Bohannon and Jason soils.

57-66/WX Preacher clay loam - Digger gravelly loam association, 10 to 60 percent slopes. 3200 acres. Deep, loamy Preacher soils make up about 65 percent of the area, and moderately deep loamy-skeletal Digger soils make up about 35 percent of the area. The Preacher soils are mostly on ridgetops and slump benches. The Digger soils are mostly on dissected steep sideslopes. About 70 percent of the slopes have gradients between 10 and 35 percent, and the remaining 30 percent have gradients between 35 and 60 percent. Mingled with the Preacher soils are minor inclusions of Blachly soils on the ridgetops, and of Slickrock soils on the slump benches. Mingled with the

Digger soils are minor inclusions of Bohannon, Umpcoos, and Jason soils.

57-66/XW Preacher clay loam - Digger gravelly loam association, 10 to 60 percent slopes. 3030 acres. Deep, loamy Preacher soils make up about 65 percent of the slopes; and moderately deep loamy-skeletal Digger soils make up about 35 percent of the area. The Preacher soils are mostly on ridgetops and slump benches. The Digger soils are mostly on dissected steep sideslopes. About 70 percent of the slopes have gradients between 35 and 60 percent, and the remaining 30 percent have gradients between 10 and 35 percent. Mingled with the Preacher soils are minor inclusions of Blachly soils on the ridgetops and of Slickrock soils on the slump benches. Mingled with the Digger soils are minor inclusions of Bohannon, Umpcoos and Jason soils.

57-66/X Preacher clay loam - Digger gravelly loam association, 35 to 60 percent slopes. 2500 acres. Deep, loamy Preacher soils make up about 65 percent of the area; and moderately deep, loamy-skeletal Digger soils make up about 35 percent of the area. The Preacher soils are mostly on ridgetops and slump benches. The Digger soils are mostly on dissected steep sideslopes. Mingled with the Preacher soils are minor inclusions of Blachly soils on the ridgetops, and of Slickrock soils on the slump benches. Mingled with the Digger soils are minor inclusions of Bohannon, Umpcoos and Jason soils.

57-66/XY Preacher clay loam - Digger gravelly loam association, 35 to 80 percent slopes. 990 acres. Deep, loamy Preacher soils make up about 65 percent of the area, and moderately deep, loamy-skeletal Digger soils make up about 35 percent of the area. The Preacher soils are mostly on ridgetops and slump benches. The Digger soils are mostly on steep and very steep dissected sideslopes. About 70 percent of the slopes have gradients between 35 and 60 percent, and about 30 percent have gradients between 60 and 80 percent. Mingled with the Preacher soils are minor inclusions of Blachly soils on the ridgetops, and of Slickrock soils on the slump benches. Mingled with the Digger soils are minor inclusions of Bohannon, Umpcoos and Jason soils and of Rock land.

57-66-10/XW Preacher clay loam - Digger gravelly loam - Blachly silty clay loam association, 10 to 60 percent slopes. 1730 acres. Deep, loamy Preacher soils make up about 50 percent of the area; moderately deep loamy-skeletal Digger soils make up about 30 percent of the area; and deep, red clayey Blachly soils make up about 20 percent of the area. The Preacher soils are mostly on rounded ridgetops and slump benches. The Digger soils are mostly on the steeper sideslopes. The Blachly

soils are mostly on ridge noses and in saddles on the ridges. About 70 percent of the slopes have gradients between 35 and 60 percent, and about 30 percent have gradients between 10 and 35 percent. Mingled with the Preacher soils are minor inclusions of Bohannon soils on the narrower ridgetops, and of Slickrock soils on the slump benches. Mingled with the Digger soils are minor inclusions of Umpcoos and Jason soils. Mingled with the Blachly soils are minor inclusions of Honeygrove soils.

57-66-10/XY Preacher clay loam - Digger gravelly loam - Blachly silty clay loam association. 35 to 80 percent slopes. 250 acres. Deep, loamy Preacher soils make up about 50 percent of the area; moderately deep, loamy-skeletal Digger soils make up about 30 percent of the area; and deep, red, clayey Blachly soils make up about 20 percent of the area. The Preacher soils are mostly on rounded ridgetops and slump benches. The Digger soils are mostly on the steep and very steep sideslopes. The Blachly soils are mostly on ridge noses and in saddles. About 70 percent of the slopes have gradients between 35 and 60 percent, and about 30 percent have gradients of 60 to 80 percent. Mingled with the Preacher soils are minor inclusions of Bohannon soils on the ridgetops, and of Slickrock soils in the basins of slump benches. Mingled with the Digger soils are minor inclusions of Umpcoos, Jason and Unit 166 soils. Mingled with the Blachly soils are minor inclusions of Honeygrove soils.

57-66-14/YX Preacher clay loam - Digger gravelly loam - Honeygrove silty clay loam association, 35 to 80 percent slopes. 360 acres. Deep, loamy Preacher soils make up about 50 percent of the area; moderately deep, loamy-skeletal Digger soils make up about 30 percent of the area; and deep red clayey Honeygrove soils make up about 20 percent of the area. The Preacher soils are mostly on ridgetops and slump benches. The Digger soils are mostly on steep and very steep dissected sideslopes. The Honeygrove soils are mostly in saddles on the ridgetops and on ridge noses. About 70 percent of the slopes have gradients between 60 and 80 percent, and about 30 percent have gradients between 35 and 60 percent. Mingled with the Preacher soils are minor amounts of Boahnnon soils on the ridgetops, and of Slickrock soils on the slump benches. Mingled with the Digger soils are minor amounts of Umpcoos and Jason soils and Rock land. Mingled with the Honeygrove soils are minor inclusions of Blachly and Peavine soils.

57-66-64/WX Preacher clay loam - Digger gravelly loam - Jason gravelly loam association, 10 to 60 percent slopes. 260 acres. Deep, loamy Preacher soils make up about 50 percent of the area; moderately deep, loamy-skeletal Digger soils make up about 30 percent of the area; and shallow loamy-skeletal Jason soils

make up about 20 percent of the area. The Preacher soils are mostly on ridgetops and slump benches. The Digger soils are mostly on steep dissected sideslopes. The Jason soils are mostly on the steep headwalls and backslopes of slumps. About 70 percent of the slopes have gradients of 35 to 60 percent. Mingled with the Preacher soils are minor inclusions of Blachly soils on the ridgetops, and of Slickrock soils on the slump benches. Mingled with the Digger soils are minor inclusions of Bohannon soils. Mingled with the Jason soils are minor inclusions of Umpcoos soils and Rock land.

(63) Bohannon Series

The Bohannon series consists of moderately deep, loamy, well-drained soils developed in colluvium from sedimentary rocks in areas having an annual precipitation of 60 to 120 inches. They occur on gently sloping to very steeply sloping mountainous uplands at elevations of 250 to 3,000 feet.

Profile Description: Bohannon gravelly clay loam.

Surface Soil:	0-10"	Dark brown gravelly clay loam, friable, strongly acid. 4 to 12 inches thick.
Subsoil:	10-34"	Dark yellowish brown gravelly clay loam, friable, strongly acid. 16 to 30 inches Thick.
Substratum:	34"+	Strongly weathered sandstone.

Representative Profile: SE 1/4 Section 13, T. 27 S., R. 10 W. About 650 Ft. east and 150 Ft. north of Jct. BLM spur roads 27-10-13.0 (Skeeter Camp) and 27-10-13.1 (Burnt Mt. Cabin)

Variations: Depth to bedrock is 20 to 40 inches. Amount of rock fragments ranges from one to 25 percent in the upper part of the profile, and increases to from 10 to 35 percent in the lower part. Surface soil color is very dark brown, very dark grayish brown, or dark brown. The texture is clay loam or loam. Subsoil color is dark yellowish brown, strong brown or yellowish brown. The texture is loam or light clay loam.

Setting: Bohannon soils occur on gently sloping ridge tops, and moderately steep to very steep side slopes at elevations between 250 and 3,000 feet. Slope gradients range from 5 to 80 percent. The soils formed in medium textured colluvium from arkosic sandstone and other sedimentary rocks.

Bohannon soils formed in a marine climate having an annual precipitation of 60 to 120 inches with a dry summer season; a mean annual temperature of 52°F; an average January temperature of 43°F; and an average July temperature of 62°F. Preacher soils are usually moist and are dry between depths of 4 and 12 inches for less than 45 consecutive days during the summer season. The average frost free period is about 190 days. The native vegetation is a coniferous tree canopy dominated by Douglas fir and hemlock, and an understory of vine maple, salal, red huckleberry, Oregon grape and braken fern.

Bohannon soils are associated with the deep fine-loamy Preacher soils; the deep, fine-loamy, thick surface-layered Slickrock soils; the moderately deep, loamy-skeletal Digger soils; the shallow, loamy-skeletal Jason soils with a paralithic contact; the shallow, loamy-skeletal Umpcoos soils with a lithic contact; and the deep, red, clayey Blachly soils.

Soil Behavior: The Bohannon soils are used for timber production, water supply, and by wildlife. The dominant trees are Douglas fir, western hemlock, grand fir, bigleaf maple, red alder and western red cedar.

Soil productivity for Douglas fir is medium. The timber site class is usually III. The available water holding capacity is moderate. The soils are usually moist and are dry between 4 and 12 inches for less than 45 consecutive days during the dry summer season. Permeability is moderate. Runoff is medium to rapid when surface vegetation has been removed. Erosion hazard is slight on slopes less than 10 percent, moderate on 10 to 35 percent slopes, and severe on slopes that exceed 35 percent. Cutbanks that exceed 15 feet in depth are generally stable over hard bedrock, but are susceptible to severe piping hazard.

Seeding mortality is moderate. Regeneration hazard is slight on north slopes and moderate on slouth slopes. Plant competition from brush and alder is generally moderate, but may be severe within the fog belt. The wind throw hazard is moderate or slight. The compaction hazard is moderate. Terrain generally is not a limitation because of smooth slopes but slopes exceeding 35 percent are too steep for the safe operation of tractors.

On slopes exceeding 60 percent, full suspension logging systems are generally most suitable. On slopes exceeding 80 percent, aerial systems may be the most suitable. The number of landings and required stations of logging roads can be reduced and erosion minimized by use of these systems. The ridgetop spur road in Figure 13 is a good example. On slopes with gradients between 35 and 60 percent, cable yarding systems, capable of suspending one end of the log, are generally suitable. The burning hazard for Bohannon soils is slight.

Wildlife habitat suitability is generally poor for openland wildlife. Bohannon soils are very poor as potential habitat for wetland wildlife.

Figure 13 Ridgetop spur road location results in least amount of disturbance in Bohannon (63) soils in Type I terrain of Flournoy Formation.

Bohannon soils are poor sources of material for the subgrade of roads because of slope. Along the temporary roads and trails water bars should be constructed to prevent the accumulation of water.

Mapping Units:

63-57/X Bohannon gravelly clay loam - Preacher clay loam association, 35 to 60 percent slopes. 5800 acres. Moderately deep, loamy Bohannon soils make up about 60 percent of the area, and deep, loamy Preacher soils make up about 40 percent of the area. The Bohannon soils are mostly on the steeper sideslopes and the narrow ridgetops. The Preacher soils are mostly on the broad ridgetops and the slump benches. Mingled with the Bohannon and Preacher soils are minor inclusions of Blachly soils on the ridgetops, and of Slickrock soils on the slump benches.

63-57/XW Bohannon gravelly clay loam - Preacher clay loam association, 10 to 60 percent slopes. 2330 acres. Moderately deep, loamy Bohannon soils make up about 60 percent of the area, and deep loamy Preacher soils make up about 40 percent of the area. The Bohannon soils are mostly on the steeper sideslopes and the sharp, narrow ridgetops. The Preacher soils are mostly on the rounded, broad ridgetops and the slump benches. About 70 percent of the slopes have gradients between 35 and 60 percent, and about 30 percent have gradients between 10 and 35 percent. Mingled with the Bohannon soils are minor inclusions of the loamy-skeletal Digger soils on the steeper sideslopes. Mingled with the Preacher soils are minor inclusions of Blachly soils on the ridgetops, and of Slickrock soils on the slump benches.

63-57/YX Bohannon gravelly clay loam - Preacher clay loam association, 35 to 80 percent slopes. 2250 acres. Moderately deep, loamy Bohannon soils make up about 60 percent of the area. The Bohannon soils are mostly on the steep and very steep sideslopes. The Preacher soils are mostly on the slump benches and on ridgetops. About 70 percent of the slopes have gradients between 60 and 80 percent, and about 30 percent have gradients between 35 and 60 percent. Mingled with the Bohannon soils are minor inclusions of Digger, Umpcoos, and Jason soils and Rock land. Mingled with the Preacher soils are minor inclusions of Blachly soils on the ridgetops, and of Slickrock soils on the slump benches.

63-57-10/X Bohannon gravelly clay loam - Preacher clay loam - Blachly silty clay loam association, 35 to 60 percent slopes. 460 acres. Moderately deep, loamy Bohannon soils make up about 40 percent of the area; deep, loamy Preacher soils make up about 35 percent of the area; and deep, red, clayey Blachly soils make up about 25 percent of the area. The Bohannon soils are

mostly on the steep sideslopes. The Preacher soils are mostly on narrow ridgetops and slump benches. The Blachly soils are mostly on broad ridgetops and ridge noses. Mingled with the Bohannon soils are minor inclusions of Digger, Jason, and Umpcoos soils. Mingled with the Preacher soils are minor inclusions of Slickrock soils on the slump benches. Mingled with the Blachly soils are minor inclusions of Honeygrove soils.

63-57-10/XW Bohannon gravelly clay loam - Preacher clay loam - Blachly silty clay loam association, 10 to 60 percent slopes. 1400 acres. Moderately deep, loamy Bohannon soils make up about 40 percent of the area; deep, loamy Preacher soils make up about 35 percent of the area; and deep, red, clayey Blachly soils make up about 25 percent of the area. The Bohannon soils are mostly on the steep sideslopes. The Preacher soils are mostly on narrow ridgetops and slump benches. The Blachly soils are mostly on broad rounded ridgetops and ridge noses. About 70 percent of the slopes have gradients between 35 and 60 percent, and about 30 percent have gradients between 10 and 35 percent. Mingled with the Bohannon soils are minor inclusions of Digger and Jason soils. Mingled with the Preacher soils are minor inclusions of Slickrock soils on the slump benches. Mingled with the Blachly soils are minor inclusions of Honeygrove soils.

63-57-10/YX Bohannon gravelly, clay loam - Preacher clay loam - Blachly silty clay loam association, 35 to 80 percent slopes. 2260 acres. Moderately deep, loamy Bohannon soils make up about 40 percent of the area; deep, loamy Preacher soils make up about 35 percent of the area; and deep, red, clayey Blachly soils make up about 25 percent of the area. The Bohannon soils are mostly on the steep and very steep sideslopes. The Preacher soils are mostly on narrow ridgetops and slump benches. The Blachly soils are mostly on broad ridgetops and ridge noses. About 70 percent of the slopes have gradients between 60 and 80 percent, and about 30 percent have gradients between 35 and 60 percent. Mingled with the Bohannon soils are minor inclusions of Digger, Jason and Umpcoos soils and Rock land. Mingled with the Preacher soils are minor inclusions of Slickrock soils on slump benches. Mingled with the Blachly soils are minor inclusions of Honeygrove soils.

63-57-64/XW Bohannon gravelly clay loam - Preacher clay loam - Jason gravelly loam association, 10 to 60 percent slopes. 350 acres. Moderately deep, loamy Bohannon soils make up about 50 percent of the area; deep, loamy, Preacher soils make up about 30 percent of the area; and shallow, skeletal, Jason soils make up about 20 percent of the area. The Bohannon soils are mostly on narrow ridge crests and smooth side slopes. The

Preacher soils are mostly on broad ridgetops. The Jason soils are mostly on the steeper dissected sideslopes. About 70 percent of the slopes have gradients of 35 to 60 percent, and about 30 percent have gradients between 10 and 35 percent. Mingled with the Bohannon soils are minor inclusions of Digger soils. Mingled with the Preacher soils are minor inclusions of Blachly and Slickrock soils. Mingled with the Jason soils are minor inclusions of Umpcoos soils.

63-57-64/XY Bohannon gravelly clay loam - Preacher clay loam - Jason gravelly loam association, 35 to 80 percent slopes. 7230 acres. Moderately deep Bohannon soils make up about 40 percent of the area; deep, loamy Preacher soils make up about 35 percent of the area; and shallow, skeletal, Jason soils make up about 25 percent of the area. The Bohannon soils are mostly on narrow ridgetops and steep sideslopes. The Preacher soils are mostly on broad ridgetops and slump benches. The Jason soils are mostly on very steep sideslopes and backslopes of slumps. About 70 percent of the area has slope gradients of 60 to 80 percent, and about 30 percent has gradients between 35 and 60 percent. Mingled with the Bohannon soils are minor inclusions of Digger soils. Mingled with the Preacher soils are minor inclusions of Blachly soils on ridgetops, and of Slickrock soils on the slump benches. Mingled with the Jason soils are minor inclusions of Umpcoos soils and rock land.

63-64/YX Bohannon gravelly clay loam - Jason gravelly loam association, 35 to 80 percent slopes. 6550 acres. Moderately deep, loamy Bohannon soils make up about 60 percent of the area, and shallow skeletal Jason soils make up about 40 percent of the area. The Bohannon soils are mostly on narrow ridgetops and steep sideslopes. The Jason soils are mostly on very steep sideslopes and backslopes of slumps. About 70 percent of the slopes have gradients between 60 and 80 percent, and about 30 percent have gradients between 35 and 60 percent. Mingled with the Bohannon soils are minor amounts of Digger and Preacher soils. Mingled with the Jason soils are minor inclusions of Umpcoos soils and rock land.

63-64/Y Bohannon gravelly clay loam - Jason gravelly loam association, 60 to 80 percent slopes. 10,110 acres. Moderately deep Bohannon soils make up about 60 percent of the area, and shallow, skeletal Jason soils make up about 40 percent of the area. The Bohannon soils are mostly on narrow ridgetops and on smooth, very steep sideslopes. The Jason soils are mostly on very steep dissected sideslopes and backslopes of slumps. Mingled with the Bohannon soils are minor inclusions of Digger and Preacher soils. Mingled with the Jason soils are minor inclusions of Umpcoos soils and Rock land.

63-64-57/XY Bohannon gravelly clay loam - Jason gravelly loam - Preacher clay loam association, 35 to 80 percent slopes. 3360 acres. Moderately deep, loamy, Bohannon soils make up about 40 percent of the area; shallow, skeletal Jason soils make up about 35 percent of the area; and deep, loamy Preacher soils make up about 25 percent of the area. The Bohannon soils are mostly on the narrow ridgetops and the steep smooth slopes. The Jason soils are mostly on the very steep sideslopes. The Preacher soils are mostly on broad ridgetops. About 70 percent of the slopes have gradients between 60 and 80 percent. Mingled with the Bohannon soils are minor inclusions of Digger soils. Mingled with the Jason soils are minor amounts of Umpcoos soils and Rock land. Mingled with the Preacher soils are minor inclusions of Blachly and Slickrock soils.

63-64-57/YX Bohannon gravelly clay loam - Jason gravelly loam - Preacher clay loam association, 35 to 80 percent slopes. 10,040 acres. Moderately deep, loamy Bohannon soils make up about 40 percent of the area; shallow, skeletal Jason soils make up about 35 percent of the area; and deep, loamy Preacher soils make up about 25 percent of the area. The Bohannon soils are mostly on narrow ridgetops and steep sideslopes. The Jason soils are mostly on the very steep sideslopes. The Preacher soils are mostly on broad ridgetops and slump benches. About 70 percent of the slopes have gradients between 60 and 80 percent. Mingled with the Bohannon soils are minor inclusions of Digger soils. Mingled with the Jason soils are minor inclusions of Umpcoos soils and Rock land. Mingled with the Preacher soils are minor inclusions of Blachly soils on the ridgetops, and of Slickrock soils on the slump benches.

63-64-57/Y Bohannon gravelly, clay loam - Jason gravelly loam - Preacher clay loam association, 60 to 80 percent slopes. 12,430 acres. Moderately deep, loamy Bohannon soils make up about 40 percent of the area; shallow skeletal Jason soils make up about 35 percent of the area; and deep loamy Preacher soils make up about 25 percent of the area. The Bohannon soils are mostly on narrow ridgetops and smooth very steep sideslopes. The Jason soils are mostly on very steep dissected sideslopes. The Preacher soils are mostly on broad ridgetops and slump benches. Mingled with the Bohannon soils are minor inclusions of Digger soils. Mingled with the Jason soils are minor inclusions of Umpcoos soils and Rock land. Mingled with the Preacher soils are minor inclusions of Blachly soils on ridgetops, and of Slickrock soils on slump benches.

63-64-R/XY Bohannon gravelly loam - Jason gravelly loam - Rock Land association, 35 to 80 percent slopes. 18,890 acres. Moderately deep, loamy Bohannon soils make up about 40 percent of the area; shallow, skeletal Jason soils make up about 35 percent of the area; and Rock land makes up about 25 percent of the area. The Bohannon soils are mostly on narrow ridgetops and steep sideslopes. The Jason soils are mostly on very steep sideslopes. The Rock land is mostly on very steep headwalls and sharp ridge crests. About 70 percent of the area has slope gradients of 35 to 60 percent, and about 30 percent has gradients between 60 and 80 percent. Mingled with the Bohannon soils are minor inclusions of Preacher and Slickrock soils. Mingled with the Jason soils are minor inclusions of Digger and Umpcoos soils. Mingled with the Rock Land are significant areas of rock outcrop.

63-64-R/YX Bohannon gravelly loam - Jason gravelly loam - Rock Land association, 35 to 80 percent slopes. 21,470 acres. Moderately deep, loamy Bohannon soils make up about 40 percent of the area; shallow skeletal Jason soils make up about 35 percent of the area; and Rock land makes up about 25 percent of the area. The Bohannon soils are mostly on narrow ridgetops and steep sideslopes. The Jason soils are mostly on very steep sideslopes. The Rock land is mostly on very steep headwalls and sharp ridge crests. About 70 percent of the slopes have gradients of 60 to 80 percent, and about 30 percent have gradients of 35 to 60 percent. Mingled with the Bohannon soils are minor inclusions of Preacher and Slickrock soils. Mingled with the Jason soils are minor inclusions of Digger and Umpcoos soils. Mingled with the Rock Land are significant areas of rock outcrop.

63-64-R/Y Bohannon gravelly loam - Jason gravelly loam - Rock Land association, 60 to 80 percent slopes. 6,120 acres. Moderately deep, loamy Bohannon soils make up about 40 percent of the area; shallow, skeletal Jason soils make up about 35 percent of the area; and Rock land makes up about 25 percent of the area. The Bohannon soils are mostly on narrow ridge crests and smooth side slopes. The Jason soils are mostly on dissected, very steep sideslopes. The Rock Land is mostly on the headwalls and sharp ridge crests. Mingled with the Bohannon soils are minor inclusions of Preacher and Slickrock soils. Mingled with the Jason soils are minor inclusions of Digger and Umpcoos soils. Mingled with the Rock land are significant areas of rock outcrop.

63-R-64/Y Bohannon gravelly clay loam - Rock land - Jason gravelly loam association, 60 to 80 percent slopes. 1770 acres. Moderately deep, loamy Bohannon soils make up about 40 percent of the area; Rock land makes up about 35 percent of the area; and

shallow, skeletal Jason soils make up about 25 percent of the area. The Bohannon soils are mostly on narrow ridgetops and the lower parts of long very steep sideslopes. The Rock Land is mostly on headwalls and on sharp ridge crests. The Jason soils are mostly on very steep side slopes. Mingled with the Bohannon soils are minor inclusions of Preacher soils. Mingled with the Rock land are minor inclusions of rock outcrop. Mingled with the Jason soils are minor inclusions of Digger and Umpcoos soils.

(64) Jason Series

The Jason series consists of shallow, loamy-skeletal, well-drained soils with a paralithic contact developed in colluvium from sedimentary rocks in areas having an annual precipitation of 60 to 120 inches. They occur on steep to extremely steep mountainous uplands at elevations of 500 to 3,000 feet.

Profile Description: Jason Gravelly Loam.

Surface soil:	0-4"	Dark brown gravelly loam, friable, strongly acid. Two to six inches thick.
Subsoil:	4-16"	Dark yellowish brown, very gravelly loam, friable, strongly acid. Six to sixteen inches thick.
Substratum:	16"+	Fractured, strongly weathered sandstone.

Representative Profile: Along north side of BLM road 21-10-12.1, about 1.4 miles from the Wassen Lake road junction in the NW 1/4, Section 7, T. 21 S., R. 9 W.

Variations: Depth to bedrock is 10 to 20 inches. Amount of rock fragments range from 15 to 50 percent in the upper part of the profile, and increases to from 35 to 75 percent in the lower part. Surface soil color is very dark brown, very dark grayish brown, or dark brown. The texture is loam or silt loam. Subsoil color is dark yellowish brown, strong brown, or yellowish brown. The texture is loam, silt loam, or light clay loam.

Setting: Jason soils occur on steep to extremely steep sideslopes, back slopes of slumps and sharp ridge crests at elevations between 500 and 3,000 feet. Slope gradients range from 35 percent to over 90 percent. The soils formed in medium textured colluvium from arkosic sandstone and other sedimentary rocks.

Jason soils formed in a marine climate having an annual precipitation of 60 to 100 inches with a dry summer season; a mean annual temperature of about 52°F; and average January temperature of 43°F; and an average

July temperature of 62°F. Unit 64 soils are usually moist and are dry between depths of 4 and 12 inches for less than 45 consecutive days during the summer season. The average frost-free period is about 190 days. The native vegetation is a coniferous tree canopy dominated by Douglas fir, incense cedar, and myrtlewood, with an understory of ocean spray, evergreen huckleberry, rhododendron, Oregon grape, madrone and manzanita.

Jason soils are associated with the shallow Umpcoos soils that have a lithic contact; the moderately deep, loamy-skeletal Digger soils; the deep, loamy-skeletal Unit 166 soils; the moderately deep, fine-loamy Bohannon soils; the deep, fine-loamy Preacher soils; and Rock Land.

Soil Behavior: The Jason soils are used for timber production, water supply and by wild life. The dominant trees are Douglas fir, big leaf maple, Oregon myrtle and red alder.

Soil productivity for Douglas fir is low. The timber site Class is usually IV. Annual tree growth is generally slow. The available water holding capacity is low. The soils are usually moist and are dry between 4 and 12 inches for less than 45 consecutive days during the dry summer season.

Permeability is moderately rapid. Runoff is medium to rapid when surface vegetation has been removed. Erosion hazard is usually severe. A severe landslide hazard exists on these soils. Waste materials are a problem in road construction, especially when they are sidecast along the pioneer road or even roads of minimum width design. Roads constructed in headwalls are quite unstable. Ridgetops are generally very narrow and suitable waste areas usually are not available. Steep sideslopes are generally very unstable. Steep sideslopes in concave areas are unstable if all the trees are cut. Road grades should be rolled, fill should be compacted in the saddles, and waste material should be end-hauled.

Seedling mortality is severe, especially on south and west slope exposures. Plant competition from brush and alder is generally moderate but is usually severe within the fog belt (see figure 14). The windthrow hazard is severe. The compaction hazard is slight. Terrain is a severe limitation to most management operations. The use of equipment is limited because slopes are usually very steep or extremely steep and rock outcrops are very common. Tree breakage may be common during falling operations. Yarding operations encounter difficulties due to both steep slope gradients and presence of rock outcrops.

On slopes exceeding 60 percent, full suspension logging systems are generally most suitable (see figure 15). On slopes exceeding 80 percent, aerial logging systems may be most suitable (see figure 16). The number of landings and required stations of logging roads can be reduced and soil erosion minimized considerably if full suspension systems are used. On slopes with gradients between 35 and 80 percent, cable yarding

Figure 14 Jason (64) and Rock Land (R) Association Landscape ten years after harvest by skyline (complete suspension) method. Lack of Douglas-fir regeneration and brush encroachment are evident. Type I terrain with 80 per cent slopes. Cutting of timber may be deferred on these lands.

Figure 15 Excess surface soil disturbance due to skid trails from highlead yarding on slopes exceeding 80 per cent in Jason-rock land-Digger association in Type I Terrain.

Figure 16 Jason-Rock land-Bohannon area in Type I terrain of Flournoy Formation harvested by helicopter. Immediate regeneration is required on extreme steep slopes (80+ per cent) to restore root strength for stabilization.

systems, capable of suspending one end of the log, are generally suitable. The burning hazard for Jason soils is severe. Practices such as thinning, planting, and cruising are difficult and hazardous because of terrain steepness.

Jason soils are poor sources of material for the subgrade of roads due to slope and have a moderate limitation for cut bank stability due to severe piping hazard, slope, and packing difficulty. Shallow depth to bedrock is a limitation for road location. Along temporary roads and trails, water bars should be constructed to prevent the accumulation of water. The burning hazard for Jason soils is severe. In many places timber harvest has been indefinitely deferred because of low yield, erosion hazard, landslide hazard and regeneration hazard.

Wildlife habitat suitability is generally poor or fair for openland wildlife and good for woodland wildlife. Jason soils are very poor as potential habitat for wetland wildlife.

Mapping Units:

64-63/YX Jason gravelly loam - Bohannon gravelly clay loam association, 35 to 80 percent slopes. 5530 acres. Shallow, skeletal Jason soils make up about 60 percent of the area, and moderately deep, loamy Bohannon soils make up about 40 percent of the area. The Jason soils are mostly on very steep sideslopes. The Bohannon soils are mostly on ridgetops and on steep sideslopes. About 70 percent of the slopes have gradients between 60 and 80 percent, and about 30 percent have gradients between 35 and 60 percent. Mingled with the Jason soils are minor inclusions of Digger and Umpcoos soils and Rock Land. Mingled with the Bohannon soils are minor inclusions of Preacher soils.

64-63/Y Jason gravelly loam - Bohannon gravelly clay loam association, 60 to 80 percent slopes. 5620 acres. Shallow, skeletal Jason soils make up about 60 percent of the area; and moderately deep, loamy Bohannon soils make up about 40 percent of the area. The Jason soils are mostly on very steep sideslopes, and the Bohannon soils are mostly on narrow ridgetops and on the lower parts of very steep sideslopes. Mingled with the Jason soils are minor inclusions of Digger and Umpcoos soils and Rock Land. Mingled with the Bohannon soils are minor inclusions of Preacher soils.

64-63-R/Y Jason gravelly loam - Bohannon gravelly clay loam - Rock Land association, 60 to 80 percent slopes. 8020 acres. Shallow, skeletal Jason soils make up about 40 percent of the area; moderately deep, loamy Bohannon soils make up about 35 percent of the area; and Rock land makes up about 25 percent of the area. The Jason soils are mostly on very steep sideslopes. The Bohannon soils are mostly on ridgetops and on the lower

parts of sideslopes. The Rock Land is mostly on very steep headwalls and on sharp crests. Mingled with the Jason soils are minor inclusions of Digger and Umpcoos soils. Mingled with the Bohannon soils are minor inclusions of Preacher soils. Mingled with the Rock Land are areas of rock outcrop.

64-66/Y Jason gravelly loam - Digger gravelly loam association, 60 to 80 percent slopes. 1090 acres. Shallow, skeletal Jason soils make up about 60 percent of the area, and moderately deep, skeletal Digger soils make up about 40 percent of the area. The Jason soils are mostly on very steep sideslopes. The Digger soils are mostly on ridgetops and the lower parts of sideslopes. Mingled with the Jason soils are minor inclusions of Umpcoos soils and Rock land. Mingled with the Digger soils are minor amounts of Bohannon, Preacher, and Unit 166 soils.

64-66-57/YX Jason gravelly loam - Digger gravelly loam - Preacher clay loam association, 35 to 80 percent slopes. 1280 acres. Shallow, skeletal Jason soils make up about 40 percent of the area; moderately deep, skeletal Digger soils make up about 35 percent of the area; and deep, loamy Preacher soils make up about 25 percent of the area. The Jason soils are mostly on very steep sideslopes. The Digger soils are mostly on narrow ridge tops and steep sideslopes. The Preacher soils are mostly on broad ridgetops and slump benches. About 70 percent of the area has slope gradients of 60 to 80 percent, and about 30 percent has gradients of 35 to 60 percent. Mingled with the Jason soils are minor inclusions of Umpcoos soils and rock land. Mingled with the Digger soils are minor inclusions of Bohannon soils. Mingled with the Preacher soils are minor inclusions of Blachly soils on ridgetops, and of Slickrock soils on slump benches.

64-66-R/Y Jason gravelly loam - Digger gravelly loam - Rock Land association, 60 to 80 percent slopes. 4680 acres. Shallow, skeletal Jason soils make up about 50 percent of the area; moderately deep, skeletal Digger soils make up about 30 percent of the area; and Rock Land makes up about 20 percent of the area. The Jason soils are mostly on very steep sideslopes. The Digger soils are mostly on narrow ridgetops and the lower parts of sideslopes. The Rock land is mostly on headwalls and sharp crests. Mingled with the Jason soils are minor inclusions of Umpcoos soils and shallow, loamy-skeletal, Xerochrepts. Mingled with the Digger soils are minor inclusions of Bohannon and Preacher soils and moderately deep, loamy-skeletal Xerochrepts. Mingled with the rock land are minor inclusions of rock outcrop.

64-R/Y Jason gravelly loam - Rock Land association, 60 to 80 percent slopes. 9470 acres. Shallow, skeletal Jason soils make up about 60 percent of the area, and Rock Land makes up about 40

percent of the area. The Jason soils are mostly on steep and very steep sideslopes and narrow ridgetops. The Rock Land is mostly on very steep headwalls and sharp ridgetops. Mingled with the Jason soils are minor inclusions of Digger, Bohannon and Preacher soils. Mingled with the Rock Land are minor inclusions of Umpcoos soils and rock outcrop. Figure 17 depicts the soilscape and a typical stand of Douglas-fir that occurs on this map unit.

64-R/YZ Jason gravelly loam - Rock Land association; 60 to 120 percent slopes. 1830 acres. Shallow, skeletal Jason soils make up about 60 percent of the area; and Rock Land makes up about 40 pereent of the area. The Jason soils are mostly on very steep sideslopes and narrow ridgetops. The Rock land is mostly on very steep headwalls and on sharp ridge crests. About 70 percent of the slopes have gradients between 60 and 80 percent, and about 30 percent have gradients between 80 and 120 percent. Mingled with the Jason soils are minor inclusions of Digger and Bohannon soils. Mingled with the Rock land are minor inclusions of Umpcoos soils and rock outcrop.

64-R-63/YX Jason gravelly loam - Rock Land - Bohannon gravelly clay loam association, 35 to 80 percent slopes. 4800 acres. Shallow, skeletal Jason soils make up about 40 percent of the area; Rock Land makes up about 35 percent of the area; and moderately deep, loamy Bohannon soils make up about 25 percent of the area. The Jason soils are mostly on very steep sideslopes. The Rock Land is mostly on very steep headwalls, and on sharp ridge crests. The Bohannon soils are mostly on ridgetops and steep side slopes. About 70 percent of the slopes have gradients between 60 and 80 percent, and about 30 percent have gradients between 35 and 60 percent. Mingled with the Jason soils are minor inclusions of Digger and Umpcoos soils. Mingled with the Rock land are minor inclusions of Umpcoos soils. Mingled with the Bohannon soils are minor inclusions of Preacher and Digger soils. Figure 18 is an example of a typical 64-R-63 soilscape in the Coos Bay District

64-R-63/Y Jason gravelly loam - Rock Land - Bohannon gravelly clay loam association, 60 to 80 percent slopes. 5900 acres. Shallow, skeletal Jason soils make up about 40 percent of the area; Rock Land makes up about 35 percent of the area; and moderately deep, loamy Bohannon soils make up about 25 percent of the area. The Jason soils are mostly on very steep sideslopes. The Rock Land is mainly on very steep headwalls, and the Bohannon soils are mostly on ridgetops and lower parts of sideslopes. Mingled with the Jason soils are minor inclusions of Digger and Umpcoos soils. Mingled with the Rock Land are minor inclusions of Umpcoos soils. Mingled with the Bohannon soils are minor inclusions of Preacher soils.

Figure 17 Jason-Rock Land Association supports a stand of 120 year old Douglas-fir trees (Site Class IV) in Type I terrain of the Flournoy Formation.

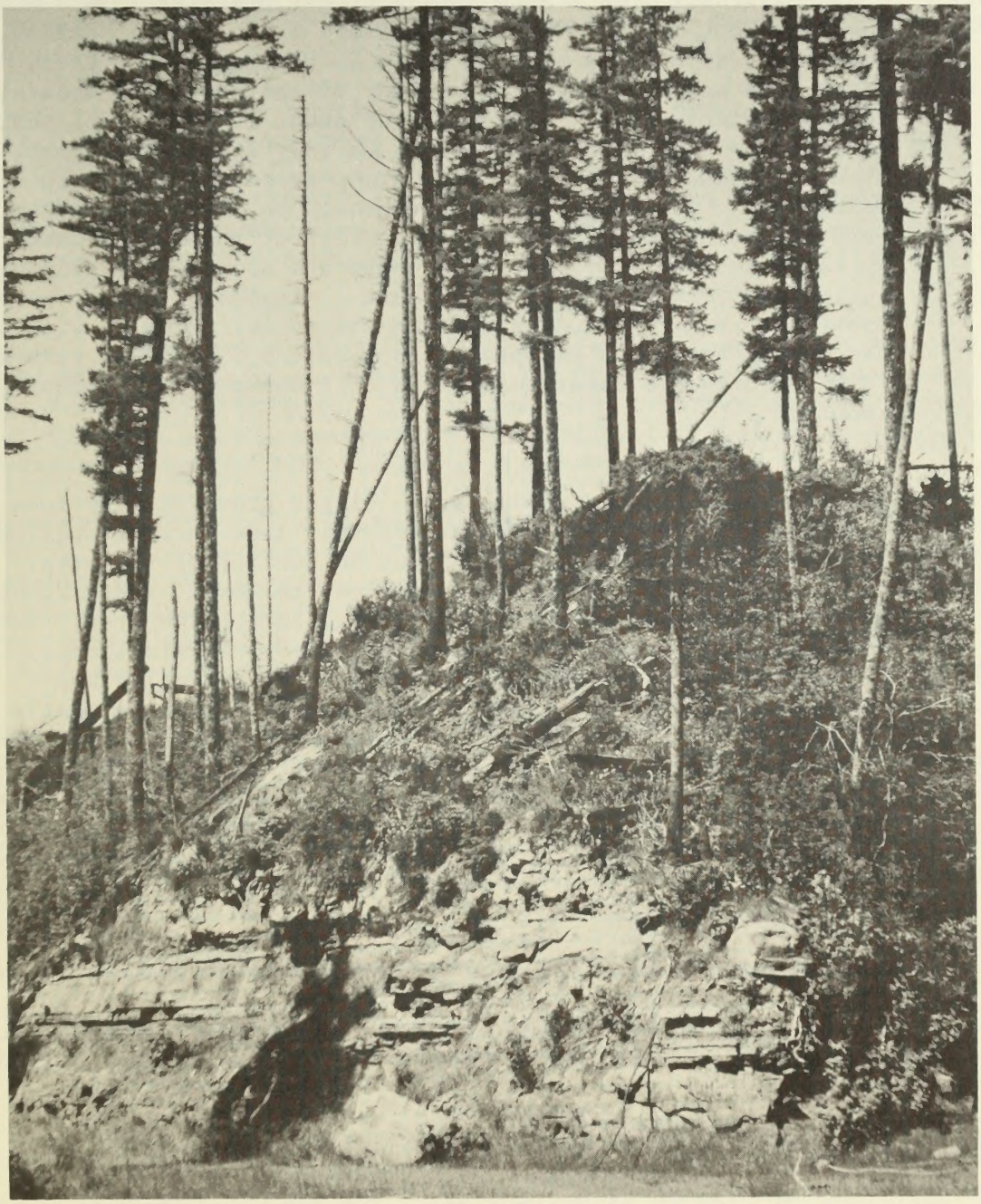

Figure 18 Typical Jason (64)-Rock land (R)-Bohannon (63) soilscape on Type I terrain in the Flournoy Formatin that has rhythmic bedding of siltstone and sandstone.

64-R-66/YX Jason gravelly loam - Rock land - Digger gravelly loam association, 35 to 80 percent slopes. 1200 acres. Shallow, skeletal Jason soils make up about 50 percent of the area; Rock land makes up about 30 percent of the area; and moderately deep, skeletal Digger soils make up about 20 percent of the area. The Jason soils are mostly on very steep sideslopes. The Rock land is mostly on very steep headwalls and sharp ridgetops. The Digger soils are mostly on steep sideslopes and narrow ridgetops. About 70 percent of the slopes have gradients between 60 and 80 percent, and about 30 percent have gradients between 35 and 60 percent. Mingled with the Jason soils are minor inclusions of Umpcoos soils. Mingled with the Rock land are small amounts of rock outcrop. Mingled with the Digger soils are minor inclusions of Bohannon and Preacher soils.

64-R-63/Z Jason gravelly loam - Rock Land - Digger gravelly clay loam association, 80 to 120 percent slopes. 1430 acres. Shallow, skeletal Jason soils make up about 40 percent of the area; Rock Land makes up about 35 percent of the area; and moderately deep Digger soils make up about 25 percent of the area. The Jason soils are mostly on very steep dissected sideslopes. The Rock Land is mostly on extremely steep headwalls and sandstone rimrock escarpments. The Digger soils are mostly on ridgetops and on toeslopes. Slope gradient ranges between 80 and 120 percent. Mingled with the Jason soils are minor inclusions of Umpcoos soils. Mingled with the Rock land are minor inclusions of rock outcrop. Mingled with the Digger soils are minor inclusions of Unit 166 and Preacher soils.

(66) Digger Series

The Digger series consists of moderately deep, loamy-skeletal, well-drained soils developed in colluvium from sedimentary rocks in areas having an annual precipitation of 60 to 100 inches. They occur on sloping to very steep mountainous uplands at elevations of 200 to 3,000 feet.

Profile Description: Digger gravelly loam.

Surface soil:	0-8"	Very dark grayish brown gravelly loam, friable, strongly acid, 3 to 7 inches thick.
Subsoil;	8-39"	Brown, very gravelly loam, friable, strongly acid. 16 to 36 inches thick.
Substratum:	30"+	Weathered, fractured sandstone

Representative Profile: SE 1/4, NE 1/4, Section 13, T. 21 S., R. 6 W. Along south fork access road approximately 750 Ft. south of Sandstone rock quarry.

Variations: Depth to weathered bedrock is 20 to 40 inches. Amount of rock fragments ranges from 15 to 60 percent in the upper part of the profile and from 40 to 80 percent in the lower part. Surface soil colors are very dark, grayish brown, dark brown or very dark brown. The texture is gravelly loam. Subsoil color is brown, yellowish brown or strong brown. The texture is very gravelly or very cobbly loam or light clay loam.

Setting: Digger soils occur on steep ridgetops and smooth or dissected sideslopes, at elevations between 200 and 3,000 feet. Slope gradients range from 5 to 80 percent. The soil formed in medium textured, gravelly colluvium from arkosic sandstone and siltstone. A typical soilscape of the Digger Jason and Unit 166 Series is shown in Figure 19.

Digger soils formed in a marine climate having an annual precipitation of 60 to 100 inches with a dry summer season; a mean annual temperature of about 52°F; and average January temperature of 43°F; and an average July temperature of 62°F. The average frost-free period is about 190 days. Digger soils are usually moist and are dry between depths of 4 and 12 inches for less than 45 consecutive days during the summer season.

The native vegetation is dominated by Douglas fir and big leaf maple with an understory of salal, ocean spray, bracken fern, vine maple and evergreen huckleberry.

Digger soils are associated with the moderately deep, fine-loamy Bohannon soils; the deep fine-loamy Preacher soils; the shallow, loamy-skeletal Jason soils with a paralithic contact; the shallow, loamy skeletal Umpcoos soils with a lithic contact; deep, clayey somewhat poorly drained Whobrey soils; and deep, clayey, well drained Etelka soils.

Soil Behavior: The Digger soils are used for timber production, water supply and by wildlife. The dominant trees are Douglas fir, big leaf maple, Oregon myrtle and red alder.

Soil productivity for Douglas fir is medium. The timber site Class is usually III. The available water holding capacity is low. The soils are usually moist and are dry between 4 and 12 inches for less than 45 consecutive days during the dry summer season.

Permeability is moderately rapid. Runoff is medium to rapid when surface vegetation has been removed. Erosion hazard generally is severe. A severe landslide hazard generally exists on Digger soils (See figures 20 and 21). Waste materials are a problem in road construction, especially when they are sidecast along the pioneer road or even roads of minimum width design. Ridgetops are generally very narrow and suitable waste areas usually are not available. Sideslopes are generally very unstable.

Figure 19 Digger (66)-Jason (64)-Unit 166 Association on headwalls, ridge noses and concave drainageway on Type I terrain of the Flourney Formation.

Figure 20 Loss of site productivity from erosion and dry ravel on extremely steep slopes of Digger (66) and Jason 64 soils in the Roseburg Formation. Deep cuts in very incompetent bedrock would have been eliminated by location of raod along ridge-top.

Figure 21 Loss of site productivity from erosion and dry ravelling of sidecast materials on extremely steep sideslopes of Digger (66) and Jason (64) soils on the Roseburg Formation. Ridgetop rather than midslope location of the road would have eliminated need for deep cuts in strongly weathered bedrock.

Seedling mortality is moderate on slopes with south and west exposures and slight on slopes with north and east exposures. Plant competition from brush and alder generally is moderate but usually is severe within the fog belt. The windthrow hazard is moderate or severe. The compaction hazard is slight. Terrain limitation to most management practices are severe. The use of equipment is limited because slopes are steep or very steep and rock outcrops are very common. Sidecast waste materials from road construction often slide downslope for great distances and commonly bury productive soils under less productive, cobbly subsoil materials (see figures 22 and 23). On slopes exceeding 60 percent, full suspension logging systems are generally most suitable. On slopes exceeding 80 percent, aerial systems may be the most suitable. The number of landings and required stations of logging roads can usually be reduced and soil erosion minimized by these systems. On slopes with gradients between 35 and 60 percent, cable yarding systems capable of suspending one end of the log are generally suitable. The burning hazard for Digger soils is slight on north or east exposed slopes and severe on slopes with south or west exposures. Practices such as thinning, planting and cruising are difficult and hazardous because of the terrain steepness.

Digger soils are poor sources of material for the subgrade of roads due to severe piping hazard, slope and packing difficulty. Moderate depth to pedrock is a limitation for road location. Midslope terrain routes in these soils should be avoided in the selection of routes for road locations. Water bars should be constructed along temporary roads and trails to prevent the accumulation of water.

Wildlife habitat suitability is generally fair for openland wildlife, especially on slopes with south exposures. Habitat suitability is generally good for woodland wildlife. Digger soils are very poor as potential habitat for wetland wildlife.

Mapping Units:

66-50-57/YX Digger gravelly loam - Apt silty clay loam - Preacher clay loam association, 35 to 80 percent slopes. 2780 acres. Moderately deep Digger soils make up about 40 percent of the area; deep, clayey Apt soils make up about 35 percent of the area; and deep, loamy Preacher soils make up about 25 percent of the area. The Digger soils are mostly on very steep sideslopes. The Apt soils are mostly on slump benches and uneven toe slopes. The Preacher soils are mostly on ridgetops and on slump benches. About 70 percent of the slopes have gradients between 60 and 80 percent, and about 30 percent of the area has gradients between 35 and 60 percent. Mingled with the Digger soils are minor inclusions of Bohannon and Jason soils. Mingled with the Apt soils are minor inclusions of Slickrock soils. Mingled with the Preacher soils are minor inclusions of Blachly soils.

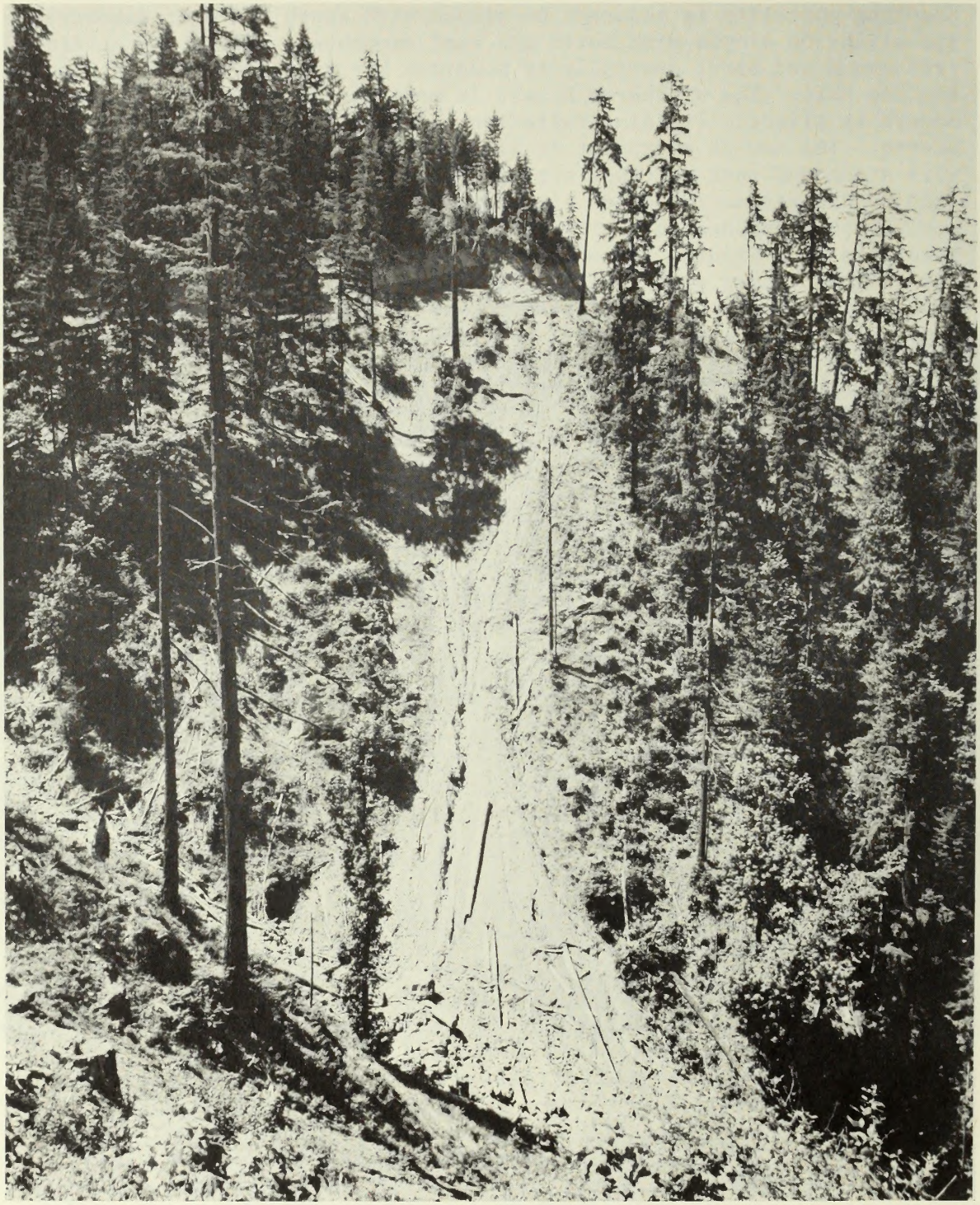

Figure 22 Loss of site productivity from debris avalanche type of slide due to sidecast of waste materials during road construction.

Figure 23 Debris avalanches initiated by the sidecast of waste materials from deep cuts during road construction in Digger (66) and Jason (64) soils.

66-50-64/XY Digger gravelly loam - Apt silty clay loam - Jason gravelly loam, 35 to 80 percent slopes. 2010 acres. Moderately deep, skeletal Digger soils make up about 40 percent of the area; deep, clayey Apt soils make up about 35 percent of the area; and shallow, skeletal Jason soils make up about 25 percent of the area. The Digger soils are mostly on steep and very steep sideslopes. The Apt soils are mostly on slump benches, uneven toeslopes, and rounded ridgetops. The Jason soils are mostly on very steep sideslopes. About 70 percent of the slopes have gradients between 35 and 60 percent, and about 30 percent have gradients between 60 and 80 percent. Mingled with the Digger soils are minor inclusions of Bohannon soils. Mingled with the Apt soils are minor inclusions of Blachly, Preacher and Slickrock soils. Mingled with the Jason soils are minor inclusions of Umpcoos soils.

66-50-64/YX Digger gravelly loam - Apt silty clay loam - Jason gravelly loam association, 35 to 80 percent slopes. 3670 acres. Moderately deep, skeletal Digger soils make up about 40 percent of the area; deep clayey Apt soils make up about 35 percent of the area; and shallow, skeletal Jason soils make up about 25 percent of the area. The Digger soils are mostly on very steep sideslopes. The Apt soils are mostly on slump benches and rounded ridgetops. The Jason soils are mostly on very steep sideslopes and headwalls. About 70 percent of the slopes have gradients between 60 and 80 percent and about 30 percent have gradients between 35 and 60 percent. Mingled with the Digger soils are minor inclusions of Bohannon soils. Mingled with the Apt soils are minor inclusions of Blachly, Preacher and Slickrock soils. Mingled with the Jason soils are minor inclusions of Umpcoos soils and Rock land.

66-57/XW Digger gravelly loam - Preacher clay loam association, 10 to 60 percent slopes. 860 acres. Moderately deep, skeletal Digger soils make up about 60 percent of the area; and deep, loamy Preacher soils make up about 40 percent of the area. The Digger soils are mostly on broad sloping ridgetops or plateaus. The Preacher soils are mostly on moderately steep to gently sloping ridgetops. About 70 percent of the slopes have gradients between 35 and 60 percent, and about 30 percent have gradients between 10 and 35 percent. Mingled with the Digger soils are minor inclusions of Jason and Umpcoos soils. Mingled with the Preacher soils are minor amounts of Bohannon and Blachly soils.

66-57/X Digger gravelly loam - Preacher clay loam association, 35 to 60 percent slopes. 1070 acres. Moderately deep, skeletal Digger soils make up about 60 percent of the area; and deep, loamy Preacher soils make up about 40 percent of the area. The Digger soils are mostly on steep sideslopes. The Preacher soils are mostly on broad ridgetops and slump benches. Mingled with the Digger soils are minor inclusions of Jason and Umpcoos soils. Mingled with the Preacher soils are minor inclusions of Blachly and Bohannon soils.

66-57-64/XY Digger gravelly loam - Preacher clay loam - Jason gravelly loam association, 35 to 80 percent slopes. 3880 acres. Moderately deep, skeletal Digger soils make up about 40 percent of the area; deep, loamy Preacher soils make up about 35 percent of the area; and shallow, skeletal Jason soils make up about 25 percent of the area. The Digger soils are mostly on steep sideslopes. The Preacher soils are mostly on broad ridgetops and uneven toeslopes. The Jason soils are mostly on very steep sideslopes. About 70 percent of the slopes have gradients between 35 and 60 percent, and about 30 percent have gradients between 60 and 80 percent. Mingled with the Digger soils are minor inclusions of Bohannon soils. Mingled with the Preacher soils are minor inclusions of Blachly soils. Mingled with the Jason soils are minor inclusions of Umpcoos soils and Rock land.

66-64-50/YX Digger gravelly loam - Jason gravelly loam - Apt silty clay loam association. 1370 acres. Moderately deep, loamy-skeletal Digger soils make up about 40 percent of the area; shallow, loamy-skeletal Jason soils make up about 35 percent of the area; and deep, clayey Apt soils make up about 25 percent of the area. The Digger soils are mostly on the very steep sideslopes, and narrow, sharp ridgetops. The Jason soils are mostly on very steep headwalls. The Apt soils are mostly on slump benches and rounded ridgetops and ridge noses. About 70 percent of the area has gradients between 60 and 80 percent, and about 30 percent has gradients between 35 and 60 percent. Mingled with the Digger soils are minor inclusions of Bohannon soils. Mingled with the Jason soils are minor inclusions of Umpcoos soils and Rock land. Mingled with the Apt soils are minor inclusions of Preacher, Blachly, and Slickrock soils.

66-64-57/YX Digger gravelly loam - Jason gravelly loam - Preacher clay loam association, 35 to 80 percent slopes. 9000 acres. Moderately deep, skeletal Digger soils make up about 50 percent of the area; shallow, skeletal Jason

soils make up about 30 percent of the area; and deep, loamy Preacher soils make up about 20 percent of the area. The Digger soils are mostly on the steep and smooth, very steep sideslopes. The Jason soils are mostly on the very steep sideslopes and headwalls. The Preacher soils are mostly on ridgetops. About 70 percent of the slopes have gradients between 60 and 80 percent, and about 30 percent have gradients between 35 and 60 percent. Mingled with the Digger soils are minor inclusions of Bohannon soils. Mingled with the Jason soils are minor inclusions of Umpcoos soils and Rock land. Mingled with the Preacher soils are minor inclusions of Blachly soils.

66-64-166/YX Digger gravelly loam - Jason gravelly loam - Unit 166 gravelly loam association, 35 to 80 percent slopes. 1120 acres. Moderately deep, skeletal Digger soils make up about 40 percent of the area; shallow, skeletal Jason soils make up about 35 percent of the area; and deep, skeletal Unit 166 makes up about 25 percent of the area. The Digger and Unit 166 soils are mostly on narrow ridgetops and very steep sideslopes. The Jason soils are mostly on very steep sideslopes, headwalls, and sharp ridgetops. About 70 percent of the slopes have gradients between 60 and 80 percent, and about 30 percent have gradients between 35 and 60 percent. Mingled with the Digger and Unit 166 soils are minor inclusions of Bohannon and Preacher soils. Mingled with the Jason soils are minor inclusions of Umpcoos soils and Rock land.

66-64-R/XY Digger gravelly loam - Jason gravelly loam - Rock land association, 35 to 80 percent slopes. 2080 acres. Moderately deep, skeletal Digger soils make up about 40 percent of the area; shallow, skeletal Jason soils make up about 35 percent of the area; and Rock land makes up about 25 percent of the area. The Digger soils are mostly on the narrow ridgetops and steep sideslopes. The Jason soils are mostly on very steep sideslopes. The Rock land is mostly on very steep headwalls and sharp ridge crests. Mingled with the Digger soils are minor inclusions of Bohannon and Preacher soils. Mingled with the Jason soils and Rock land are minor inclusions of Umpcoos soils and rock outcrop.

66-64-R/Y Digger gravelly loam - Jason gravelly loam - Rock land association, 60 to 80 percent slopes. 19,410 acres. Moderately deep, skeletal Digger soils make up about 40 percent of the area; shallow, skeletal Jason soils make up about 35 percent of the area; and Rock land makes up about 25 percent of the area. The Digger soils are

mostly on very steep smooth sideslopes and narrow ridgetops. The Jason soils and Rock land are mostly on very steep, dissected sideslopes, headwalls, and sharp ridgetops. Mingled with the Digger soils are minor inclusions of Bohannon and Preacher soils. Mingled with the Jason soils and Rock land are minor inclusions of Umpcoos soils and rock outcrop.

66-64-R/YZ Digger gravelly loam - Jason gravelly loam - Rockland association, 60 to 120 percent slopes, 650 acres. Moderately deep, skeletal Digger soils make up about 40 percent of the area; shallow, skeletal Jason soils make up about 35 percent of the area and Rock land makes up about 25 percent of the area. The Digger soils are mostly on very steep, smooth sideslopes and narrow ridgetops. The Jason soils and Rock land are mostly on very steep, dissected sideslopes, headwalls, and sharp ridgetops. About 70 percent of the slopes have gradients between 60 and 80 percent, and about 30 percent of the slopes have gradients between 80 and 120 percent. Mingled with the Digger soils are minor inclusions of Bohannon and Unit 166 soils. Mingled with the Jason soils and Rock land are minor inclusions of Umpcoos soils and rock outcrop.

66-557-501/XY Digger gravelly loam - Etelka silt loam - Whobrey silt loam association, 35 to 80 percent slopes. 390 acres. Moderately deep, skeletal Digger soils make up about 40 percent of the area; deep, clayey Etelka soils make up about 35 percent of the area; and deep, somewhat poorly drained, silty over clayey, Whobrey soils make up about 25 percent of the area. The Digger soils are mostly on ridgetops and back slopes of large slumps and mass movement areas. The Etelka soils are mostly on convex interfluves and finger ridges within the large slumps and mass movement areas. The Whobrey soils are mostly on concave toeslopes and shallow drainageways within the large slump and mass movement areas. Mingled with the Digger soils are minor inclusions of Bohannon and Preacher soils. Mingled with the Etelka and Whobrey soils are minor inclusions of Orford soils.

(166) Unnamed Unit 166 Series

The Unit 166 series consists of deep, loamy-skeletal, well drained soils developed in colluvium from sedimentary rocks in areas having an annual precipitation of 60 to 100 inches. They occur on steep to very steep mountainous uplands at elevations of 200 to 3,000 feet.

Profile Description: Unit 166 Gravelly Loam

Surface Soil	0-6"	Very dark grayish brown gravelly loam, very friable, strongly acid. Four to eight inches thick.
Subsoil:	7-44"	Brown, very gravelly loam, friable, strongly acid. Thirty-two to Forty-eight inches thick.
Substratum:	44"+	Weathered, fractured sandstone.

Representative Profile: SW 1/4 Section 1, T. 22 S., R. 10 W. Approximately 250 feet from end of USFS Rd. 2175.

Variations: Depth to weathered bedrock is 40 to over 60 inches. Amount of rock fragments ranges from 20 to 40 percent in the upper part of the profile, and from 40 to 80 percent in the lower part. Surface soil colors are very dark grayish brown, dark grayish brown or dark brown. The texture is gravelly loam or gravelly silt loam. The color of the subsoil is brown, yellowish brown, or grayish brown. The texture is very gravelly or very cobbly loam or light clay loam.

Setting: Unit 166 soils occur on steep and very steep ridgetops and sideslopes at elevations between 200 and 3,000 feet. Slope gradients generally range from 35 to 80 percent. The soils formed in medium textured gravelly colluvium from arkosic sandstone and siltstone.

Unit 166 soils formed in a marine climate having an annual precipitation of 60 to 100 inches with a dry summer season; a mean annual temperature of about 52°F.; an average January temperature of 43°F.; and an average July temperature of 62°F. The average frost-free period is about 190 days. Unit 166 soils are usually moist and are dry between depths of 4 and 12 inches for less than 45 consecutive days during the dry summer season. The natural vegetation is dominated by Douglas fir and big-leaf maple with an understory of salal, ocean spray, bracken fern, vine maple and evergreen huckleberry.

Unit 166 soils are associated with the moderately deep, loamy-skeletal Digger soils; the shallow, loamy-skeletal Jason soils; moderately deep, fine-loamy Bohannon soils, and deep, fine-loamy Preacher soils.

Soil Behavior: The 166 soils are used for timber production, water supply and by wildlife. The dominant trees are Douglas fir, big leaf maple and red alder.

Soil productivity for Douglas fir is medium. The timber site Class is usually III. The available water holding capacity is moderate. The soils are usually moist and are dry between 4 and 12 inches for less than 45 consecutive days during the dry summer season.

Permeability is moderately rapid. Runoff is medium to rapid when surface vegetation has been removed. Erosion hazard generally is severe. Landslide hazard is generally moderate on Unit 166 soils. Waste materials from road construction commonly move downslope for great distances and bury productive soils under less productive, cobbly subsoil material.

Seedling mortality is moderate on slopes with south and west exposures and slight on slopes with north or east exposures. Plant competition from brush and alder generally is moderate but usually is severe within the fog belt. The windthrow hazard is moderate or severe. The compaction hazard is slight. Terrain limitation to management practices are severe. Rock outcrops are common and may cause tree breakage during falling and present difficulties in yarding operations. Such management practices as thinning, planting and cruising are difficult and hazardous due to slope steepness. On slopes that exceed 60 percent, full suspension logging systems are generally most suitable. Aerial systems may be the most suitable on slopes exceeding 80 percent. The number of landings and required stations of logging roads can usually be reduced and soil erosion minimized by these systems. On slopes with gradients between 35 and 60 percent, cable yarding systems which suspend one end of the log are generally suitable. Such management practices as thinning, planting and cruising are difficult and hazardous due to slope steepness.

Unit 166 soils are poor sources of material for the subgrade of roads due to severe piping hazard, slope and packing difficulty. Midslope terrain in these soils should be avoided in the selection of routes for road locations. Trails and temporary roads should be protected with water bars to help prevent severe gully erosion. Burning hazard is slight on slopes with north and east exposures and severe on south and west exposures.

Wildlife habitat suitability is generally fair for openland wildlife, especially on slopes with south exposures. Habitat suitability is generally good for woodland wildlife. Unit 166 soils are very poor as potential habitat for wetland wildlife.

Mapping Units: Unit 166 soils are not dominant in any of the mapping units. They are tertiary soils and inclusions in the mapping units of the Digger soils, and inclusions in mapping units of the Jason, Bohannon and Preacher soils.

(501) Whobrey Series

The Whobrey series consists of deep, somewhat poorly drained soils formed in colluvium and residuum weathered from old, deeply weathered sedimentary rocks. The A and B horizons are brown and silty, and the substratum is very dark gray and clayey. These soils occur in areas having an annual precipitation of 60 to 80 inches. They occur on gently sloping to steep, slumping sideslopes, ridgetops and saddles in the Klamath Mountains.

Profile Description: Whobrey silt loam.

Surface Soil:	0-11"	Brown silt loam, friable, medium acid. 10 to 15 inches thick.
Subsoil:	11-20"	Dark yellowish brown silt loam, friable, medium acid. 8 to 14 inches thick.
Substratum:	20-60"+	Very dark gray clay, very firm, massive, moderately alkaline.

Representative Profile: SE 1/4, SE 1/4, SW 1/4 Section 35, T. 29 S., R. 12 W.

Variations: Depth to hard bedrock is generally greater than 60 inches. Thickness of the silty solum is 20 to 36 inches. Hard shiny pebbles make up from 1 to 15 percent of the clayey substratum. The color of the surface soil is very dark grayish brown, dark grayish brown, dark brown, dark yellowish brown, or brown. The surface soil texture is silt loam or light silty clay loam. The subsoil color is mottled dark yellowish brown, yellowish brown, dark brown, brown or olive brown. The texture of the subsoil is silty clay loam or silt loam. The color of the substratum is black, very dark grayish brown or dark olive gray. The texture is clay or silty clay. The change in texture between the subsoil and the substratum is abrupt. The substratum is massive with few to common slickensides.

Setting: The Whobrey soils are on concave positions on sloping to very steep slumping mountainous topography at elevations between 200 and 1,600 feet. Slope gradients range from 10 to 60 percent. The soils form in silty colluvium from highly fractured, intensely sheared, and deeply weathered sedimentary rocks of Jurassic Age; mostly of the Otter Point formation. The climate is marine, having an annual precipitation between 60 and 80 inches with a dry season during the summer. The mean annual temperature is 52°F., the average January temperature is about 45°F, and the average July temperature is about 62°F. The average frost-free period is about 190 days. Native vegetation consists of a coniferous tree canopy dominated by Douglas fir, grand fir, hemlock and western red cedar. The understory is mixed shrubs and forbs such as salal, rhodendendron, red huckleberry, evergreen blackberry, ocean spray, wild iris, sword fern, and tansy ragwort.

Whobrey soils are associated with the deep, moderately well drained, clayey Etelka soils; the moderately deep, loamy-skeletal Digger soils, the moderately deep, loamy Bohannon soils, and the deep, loamy Preacher soils. A typical melange landscape of Whobrey (501) soils in association with Etelka (557) soils is shown in Figures 24 and 25.

Figure 24 Small outcroppings of metamorphic rock called "pods" at left center, right center and extreme right center adjacent to concave, slumping sideslope, convex ridgetop and saddle of Whobrey (501) and Etelka (557) soils of the Otter Point Formation.

Figure 25 Typical melange landscape of the Otter Point Formation and soils of the Whobrey (501) - Etelka (557) Association. Note vertical displacement along downslope side of slumping ridges and effect on alignment of road below. Baker Creek BLM access road.

Soil Behavior: The Whobrey soils are used for timber production, water supply, farming, homesites, recreation and by wildlife. The dominant trees are Douglas fir, grand fir, hemlock, western red cedar, Port Orford cedar and red alder.

Soil productivity for Douglas fir is high. The timber Site Class is usually III+. The available water holding capacity is high. The soils are usually moist and are dry, between 4 and 12 inches, for less than 45 consecutive days during the dry summer season.

Permeability is very slow. Runoff is medium to rapid when surface vegetation has been removed. Erosion hazard is generally moderate or severe. Landslide hazard generally is severe on Whobrey soils. Figure 26 depicts a typical unstable landscape of Whobrey (501) soils.

Slope failures are common on gradients of less than 20 percent. Unsurfaced roads located in these soils are unsuitable as winter logging access. Water seeps commonly occur throughout the soil areas, and may even be found on the ridge crests. The very clayey substratum often is exposed when equipment is used in the scraping operations to construct roads, trails, and landings. Special drainage designs (i.e. extra culverts horizontal drains in cutbank, perforated pipe in ditch linings) and special road designs (i.e. rock blankets and/or pilings for support of fills) are usually required to minimize watershed damage on these soils. Road fill failures are very frequent because of very poor bearing capacity, high shrink-swell and low shear strength. Midslope terrain is hazardous for road locations. Figure 27 shows a recent cutbank slope failure due to piping.

Seedling mortality is slight. Plant competition from brush and alder is moderate to severe. A severe windthrow hazard exists on these soils. The use of equipment is limited because of soil characteristics such as high shrink-swell, depth to clay, compressibility and drainage characteristics. Scarification and gross yarding operations have severe limitations because the moisture content of these soils seldom drops below the plastic limit, even during the summer dry season. Tractor logging is generally an unsuitable management practice on these soils, due to excessive site damage. Cable logging systems with one end or full suspension capability are generally suitable for use in logging operations on these soils. Burning hazard is slight.

Whobrey soils are poor sources of material for subgrade of roads because of low shear strength and high shrink-swell. Water bars should be constructed along temporary roads and trails to prevent the accumulation of water. Roads need extra material for base stabilization and surfacing.

Wildlife habitat suitability is generally good for openland wildlife and woodland wildlife. Grouse and quail frequent the seeps and flowing springs associated with these soils. Whobrey soils are poor as potential habitat for wetland wildlife.

Figure 26 "Jackstrawed" and "crazy trees" are common on unstable landscape of the Whobrey (501) soils formed in materials weathered from the Otter Point Formation. Landscapes like these should be avoided in road locations.

Figure 27 Cutbank slope failures in one year old established seeding due to piping on Whobrey (501) and Etelka (557) soils of the Otter Point Formation. Sources of pore water pressure and seepage force are numerous seeps and flowing springs that outcrop along sideslopes.

Septic tank absorption fields and sanitary landfills constructed on Whobrey soils have severe limitations because of slow permeability, high shrink-swell, perched water table and slope. Potential building sites should be examined on-site for suitability.

Rock outcrops inclusions, (called pods) associated with Whobrey soils, are often good sources of quarry material. Generally, these are composed of blueschist (Baker Creek Quarry and Kincheloe Quarry), Chert, or altered volcanic rock. Figure 28 shows the large partially quarried pod of blue schist rock at the Baker Creek Quarry near Powers, Oregon.

Mapping Units:

501-557/WX Whobrey silt loam - Etelka silt loam, association, 10 to 60 percent slopes. 4840 acres. Deep, somewhat poorly drained Whobrey soils make up about 70 percent of the area; and deep, moderately well drained Etelka soils make up about 30 percent of the area. The Whobrey soils are mostly on concave slumping sideslopes, and in saddles on ridgetops. The Etelka soils are mostly on convex knobs on ridgetops, and on finger ridges or interfluves on the sideslopes. About 70 percent of the slopes have gradients between 10 and 35 percent, most of which are covered with Whobrey soils. About 30 percent have gradients between 35 and 60 percent, most of which are covered with Etelka soils. Mingled with the Etelka soils are minor inclusions of Digger soils; mostly on the noses of the finger ridges. Mingled with the Whobrey soils are minor inclusions of unclassified poorly drained, very dark gray, clayey soils.

501-557/X Whobrey silt loam - Etelka silt loam association, 35 to 60 percent slopes. 860 acres. Deep, somewhat poorly drained Whobrey soils make up about 60 percent of the area and deep, moderately well drained Etelka soils make up about 40 percent of the area. The Whobrey soils are mostly on concave, slumping sideslopes and in saddles on ridgetops. The Etelka soils are mostly on convex knobs on ridgetops and on finger ridges or interfluves on the sideslopes. Mingled with the Etelka soils are minor inclusions of deep, loamy Preacher soils on the ridgetops and moderately deep, skeletal Digger soils on the ridgenoses.

501-557/XW Whobrey silt loam - Etelka silt loam association, 10 to 60 percent slopes. 524 acres. Deep somewhat poorly drained Whobrey soils make up about 60 percent of the area, and deep, moderately well drained Etelka soils make up about 40 percent of the area. The Whobrey soils are mostly on concave slumping sideslopes, and in saddles on ridgetops. The Etelks soils are mostly on convex knobs

Figure 28 Baker Creek Quarry - A large Pod of Blueschist rock outcrop in the Otter Point Formation. One of the prime sources of competent rock that are scarce in the Coos Bay District.

on ridgetops and on finger ridges or interfluves on the sideslopes. About 70 percent of the slopes have gradients between 35 and 60 percent, and about 30 percent have gradients between 10 and 35 percent. Mingled with the Etelka soils are minor inclusions of deep loamy Preacher soils on the ridgetops, and of moderately deep, skeletal Digger soils on the ridgenoses.

(503) Unnamed Unit 503 Series

The Unit 503 series consists of deep, red, fine-loamy soils formed in materials weathered from serpentinite and peridotite in areas receiving from 60 to 100 inches of precipitation. They occur on gently sloping to steep mountainous uplands of southern coastal Oregon.

Profile Description: Unit 503 Cobbly Silty Clay Loam

Surface soil:	0-14"	Dusky red, cobbly silty clay loam, friable, medium acid. 6 to 16 inches thick.
Subsoil:	14-50"	Dark red, cobbly, light silty clay loam, firm, slightly acid. 35 to 60 inches thick.
Substratum	50"+	Black and green serpentinite.

Representative Profile: SE 1/4 Section 13, T. 37 S., R. 14 W. Approximately 10 Ft. from south 1/4 corner Section 13/24 in east cutbank of USFS Rd. 368.

Variations: Depth to bedrock is 40 to 60 or more inches. Rock fragments of all sizes make up from 10 to 30 percent of the surface and subsurface layers. The reaction is medium acid or strongly acid. The color of the surface layer is reddish brown, dark reddish brown, or dusky red. The texture of the surface layer is cobbly or stony clay loam or silty clay loam. The color of the subsoil is red, reddish brown, or yellowish red. The texture of the subsoil is cobbly or gravelly heavy clay loam or silty clay loam.

Setting: The Unit 503 soils are on gently sloping to steep mountainous uplands at elevations of 200 to 2,800 feet. Slope gradients range from 10 to 60 percent. The soils formed in colluvium and residuum weathered from serpentinite and peridotite. The climate is mild humid marine type, with a mean annual precipitation of 60 to 100 inches, and a dry summer period of less than 45 days. The mean annual temperature is about 52°F.; the average January temperature is about 45°F.; and the average July temperature is about 59°F. The frost-free period is about 220 days. The native vegetation is knobcone pine, Jeffrey pine, and wedgeleaf ceanothus.

Unit 503 soils are associated with unclassified, shallow, loamy-skeletal soils from serpentinite that are treated as an inclusion in this inventory; with soils of the Edson and Unit 505 series on adjacent areas underlain by schistose slate; with soils of the Dement and Unit 530 series on adjacent areas underlain by sedimentary rocks; and with Rock land.

Soil Behavior: The Unit 503 soils are used for recreation, water supply, mining and by wildlife. The dominant tree on this soils is knobcone pine with some Jeffrey pine, lodgepole pine and stunted Port Orford cedar.

Unit 503 soils are unproductive for Douglas fir. They are classed as Low Site (Non-Forest) for timber production. The unusual taxonomic assemblage of plants has been extensively studied by botanists, educators, students and amateur gardeners. Soil scientists find particular interest in the soil fertility problems and aspects of soil formation unique to these soils. Historical and economic geologists have extensively studied the weathering and tectonic origin of the parent ultramafic rocks. Potentially valuable deposits of nickel, and chromium are associated with Unit 503 soils.

Permeability is moderate. Runoff is slow to rapid. Erosion hazard is moderate to severe. Landslide hazard is moderate to severe.

Unit 503 soils are poor sources of material for subgrade of roads because of low shear strength and severe piping hazard. Water bars should be constructed along temporary roads and trails to prevent the accumulation of water and reduce erosion. Roads need extra material for base stabilization and surfacing.

Fault zones generally occur at the contact of these materials and other geologic formations. These fault zones are unsuitable locations for roads and structures.

Wildlife habitat suitability is generally good for openland wildlife and woodland wildlife. Unit 503 soils are poor as potential habitat for wetland wildlife.

Septic tank absorption fields and sanitary landfills constructed on 503 soils have severe limitations because of slope and coarse fragments. Potential building sites should be examined on-site for suitability.

Mapping Units:

503-R/XW Unit 503 cobbly loam - Rock land association, 10 to 60 percent slopes. 580 acres. Deep red, clayey Unit 503 soils make up about 70 percent of the area; and Rock land makes up about 30 percent of the area. The Unit 503 soils and Rock land are randomly distributed throughout the delineations. About 70 percent of the slopes have gradients between 35 and 60 percent, and about 30 percent have gradients between 10 and 35 percent. Mingled with the Unit 503 soils and the Rock land are minor inclusions of unclassified, shallow, loamy-skeletal soils from serpentinite.

(505) Unnamed Unit 505 Series

The Unit 505 series consists of moderately deep, brown, loamy-skeletal soils formed in colluvium weathered from schistose slate quartz-phyllite and schist in areas receiving between 60 to 100 inches of precipitation. They occur on steep uplands in southern coastal Oregon.

Profile Description: Unit 505 Gravelly Silt Loam

Surface soil;	0-8"	Dark brown, gravelly silt loam, friable, very strongly acid. 6 to 10 inches thick.
Subsoil:	9-29"	Strong brown, very gravelly silty clay loam, friable, strongly acid. 14 to 32 inches thick.
Substratum:	29-45"	Highly fractured schistose slate with soil in the cracks.

Representative Profile: Along BLM road 35-13-30.0 1/4 mile east of west quarter corner of Section 15, T. 35 S., R. 13 W.

Variations: Depth to highly fractured slate is 20 to 40 inches and depth to unfractured rock is deeper than 40 inches. Rock fragment content ranges from 35 to 50 percent in the surface layer, and from 40 to 75 percent in the subsoil. The reaction is very strongly acid or strongly acid throughout the solum. The color of the surface layer is dark brown, brown, or dark yellowish brown. The texture is very gravelly loam, very gravelly clay loam, very gravelly silt loam, or very gravelly silty clay loam.

Setting: The Unit 505 soils are on steep mountainous uplands at elevations of 200 to 2,800 feet. Slope gradients range from 35 to over 60 percent. They formed in residium and colluvium weathered from schistose slate and schist of the Colebrook schist formation. The climate is a mild-humid marine type with a mean annual precipitation of 60 to 100 inches and a dry summer period of more than 45 days. The mean annual temperature is about 50° to 52°F.; the average January temperature is about 45°F., and the average july temperature is about 59°F. The frost-free period is about 220 days. The native vegetation consists of a coniferous forest canopy dominated by Douglas fir, western hemlock, red alder, and tanoak. The understory consists of salal, rhododendron, evergreen huckleberry, bracken fern, and sword fern.

Unit 505 soils are associated with the deep, red, clayey Edson soils from schistose slate and schist; deep, red fine-loamy Unit 503 soils from serpentine and peridotite; deep, red clayey Dement soils from graywacke; moderately deep, loamy-skeletal Unit 530 soils from graywacke, and Rock land.

Soil Behavior: The Unit 505 soils are used for timber production, water supply and by wildlife. The dominant trees are Douglas fir, western hemlock, red alder and tanoak.

Soil productivity for Douglas fir is low. The timber site Class is usually IV+. The available water holding capacity is low. The soils are usually moist and are dry between 4 and 12 inches for more than 45 consecutive days during the dry summer season.

Permeability is moderately rapid. Runoff is slow to rapid. Erosion hazard generally is severe. Landslide hazard is moderate. Cutbanks that exceed 15 feet are highly unstable because of low shear strength. Sideslopes are generally unstable.

Seedling mortality is severe on slopes with south and/or west exposures and moderate on slopes with north and east exposures. Plant competition from brush and tanoak is moderate but usually is severe within the fog belt. The windthrow hazard is moderate to severe. The compaction hazard is slight. The use of equipment is limited because slopes are steep and rock outcrops are common. On slopes with gradients between 35 and 60 percent, cable yarding systems are generally suitable because the amount of soil disturbance is kept to a minimum with adequate scarification. The burning hazard for Unit 505 soils is moderate on north or east slope exposures and severe on south and west slope exposures.

Unit 505 soils are poor sources of material for the subgrade of roads due to slope, low compressibility, piping hazard and low bearing strength. Midslope terrain routes in these soils should be avoided in the selection of sites for road locations. Water bars should be constructed along temporary roads and trails to prevent accumulation of water and severe gully erosion.

Wildlife habitat suitability is generally fair for openland wildlife and good for woodland wildlife. Unit 505 soils are very poor as potential habitat for wetland wildlife.

505-R/X Unit 505 gravelly silt loam - Rock land, 35 to 60 percent slopes. 1100 acres. Moderately deep, loamy-skeletal Unit 505 soils make up about 70 percent of the area; and Rock Land makes up about 30 percent of the area. The Unit 505 soils are mostly on steep dissected sideslopes and ridgetops. The Rock Land is mostly on isolated rocky hills or "pods". Mingled with the Unit 505 soils are minor inclusions of Edson soils on the slump benches and ridgetops.

(520) Unnamed Unit 520 Series

The Unit 520 series consists of deep, red, fine-loamy soils formed in colluvium and residuum from old volcanic rocks in areas receiving from 80 to 100 inches of precipitation. They occur on moderately steep to very steep buttes and ridges in mountainous uplands of southern coastal Oregon.

Profile Description: Unit 520 Loam

Surface soil:	0-5"	Reddish brown, loam, friable, very strongly acid. 4 to 8 inches thick.
Subsoil:	5-42"	Red, cobbly, silty clay loam, firm, very strongly acid. 32 to 45 inches thick.
Substratum	42"+	Highly weathered, old volcanic rocks.

Representative Profile: Center of SE 1/4, Section 10, T. 40 S., R. 13 W.

Variations: Depth to bedrock is from 40 to 60 inches. Rock fragment content is between 2 and 10 percent in the surface layer, and between 5 and 35 percent in the subsoil. The soil reaction is strongly acid or very strongly acid. The color of the surface layer is reddish brown, brown, or dark reddish brown. The texture of the surface layer is loam or light clay loam. The color of the subsoil is yellowish red, reddish yellow or red. The texture of the subsoil is cobbly light clay loam, or cobbly light silty clay loam.

Setting: The Unit 520 soils are on moderately steep to very steep buttes and ridges in mountainous uplands at elevations of 500 to 2,800 feet. Slope gradients range from 10 to 80 percent with most areas being steeper than 35 percent. The soils formed in colluvium and residuum weathered from old volcanic members of the Dothan formation. The climate is a mild humid marine type with a mean annual precipitation of 60 to 120 inches, and a dry summer period at least 45 days long. The mean annual temperature is about 52°F.; the average January temperature is about 45°F.; and the average July temperature is about 60°F. The frost-free period is about 220 days. The native vegetation is Douglas fir, knobcone pine, chinkapin and madrone with an understory of manzanita, dwarf tanoak, rhododendron and evergreen huckleberry.

Unit 520 soils are associated with the moderately deep, red, loamy-skeletal Unit 521 soils from old volcanic rocks; the deep red, clayey Dement soils, and the moderately deep, loamy-skeletal Unit 530 soils from graywacke; and Rock land.

Soil Behavior: The Unit 520 soils are used for recreation, water supply, and by wildlife. The dominant trees on this soil are Douglas fir, knobcone pine, chinkapin and madrone.

Unit 520 soils are unproductive for Douglas fir. They are classed as Low Site (Non-Forest) for timber production. The timber site class for Douglas fir is generally V or less. The available water holding capacity is moderate. The soils are usually moist and are dry between 4 and 12 inches for more than 45 consecutive days during the dry summer season.

Permeability is moderate. Runoff is slow to rapid. Erosion hazard is generally moderate to severe. Landslide hazard is slight to moderate.

Unit 520 soils are poor sources of material for subgrade of roads because of low bearing capacity, low compressibility and low shear strength. Water bars should be constructed along temporary roads and trails to prevent accumulation of water and severe gully erosion.

Wildlife habitat suitability is generally good for openland wildlife and poor for woodland wildlife. Unit 520 soils are generally unsuitable as potential habitat for wetland wildlife.

Unit 520 soils have severe limitations as potential sites for septic tank absorption fields, sanitary landfills, buildings, and camp areas due to slope.

Mapping Units:

520-521-R/XW Unit 520 loam - Unit 521 gravelly loam- Rock land association, 10 to 60 percent slopes. 2640 acres. The deep, red, loamy 520 soils make up about 40 percent of the area; the moderately deep, loamy-skeletal 521 soils make up about 40 percent of the area; and Rock land makes up about 20 percent of the area. The Unit 520 soils are mostly on moderately sloping to steep sideslopes and crests of buttes and ridges. The Unit 521 soils are mostly on steep dissected sideslopes and narrow crests of buttes and ridges. The Rock land is mostly on steep slump escarpments and sharp ridge crests. About 70 percent of the slopes have gradients between 35 and 60 percent, and about 30 percent have gradients between 10 and 35 percent. Mingled with the Unit 520 soils are minor inclusions of Dement soils. Mingled with the Unit 521 soils and Rock land are minor inclusions of Unit 530 soils.

520-521-R/YX Unit 520 loam - Unit 521 gravelly loam - Rock land association, 35 to 80 percent slopes. 1790 acres. The deep, red, loamy Unit 520 soils make up about 40 percent of the area; the moderately deep, loamy-skeletal Unit 521 soils make up about 35 percent of the area; and the Rock land makes up about 25 percent of the area. The Unit 520 soils are mostly on steep smooth sideslopes and ridgetops. The Unit 521 soils are mostly on dissected, very steep sideslopes and slump benches. Rock Land is mostly on very steep slump escarpments and headwalls. About 70 percent of the slopes have gradients between 60 and 80 percent, and about 30 percent have gradients between 35 and 60 percent. Mingled with the Unit 520 soils are minor inclusions of Dement soils. Mingled with the Unit 521 soils and Rock land are minor inclusions of Unit 530 soils.

(521) Unnamed Unit 521 Series

The Unit 521 series consists of moderately deep, reddish, loamy-skeletal soils formed in materials weathered from old volcanic rocks in areas receiving from 80 to 100 inches of precipitation. They occur on moderately steep to very steep buttes and ridges in mountainous uplands of southern coastal Oregon.

Profile Description: Unit 521 gravelly loam.

Surface soil:	0-6"	Dark brown, gravelly loam, friable, strongly acid. 4 to 8 inches thick.
Subsoil:	6-29"	Yellowish red, gravelly, silty clay loam, friable, medium acid. 14 to 34 inches thick.
Substratum	29"+	Hard, slightly fractured, volcanic rock.

Representative Profile: SE 1/4, Section 10, T. 39 S., R. 13 W. Along Bosley Butte L.O. Rd.

Variations: Depth to bedrock is from 20 to 40 inches. Rock fragments content is from 15 to 50 percent in the surface soil, and from 35 to 75 percent in the subsoil. The soil reaction is strongly acid. The color of the surface layer is reddish brown, brown, or dark brown. The texture is gravelly loam or gravelly light clay loam. The color of the subsoil is yellowish red, reddish yellow or red. The texture of the subsoil is very gravelly loam or very gravelly light silty clay loam.

Setting: The Unit 521 soils are on moderately steep to very steep buttes and ridges in mountainous uplands at elevations of 500 to 2,800 feet. Slope gradients are mostly between 35 and 80 percent. The soils formed in colluvium and residuum weathered from old volcanic members of the Dothan formation. The climate is a mild, humid marine type with a mean annual precipitation of 60 to 120 inches, and a dry summer period at least 45 days long. The mean annual temperature is about 52°F.; the average January temperature is about 45°F.; and the average July temperature is about 60°F. The frost-free period is about 220 days. The native vegetation is knobcone pine, chinkapin, rhododendron, dwarf tanoak, and manzanita.

Unit 521 soils are associated with the deep, red, fine-loamy Unit 520 soils from old volcanic rocks; the deep red, clayey Dement soils; and the moderately deep, loamy-skeletal Unit 530 soils from graywacke, and with Rock land.

Soil Behavior: The Unit 521 soils are used for recreation, water supply, and by wildlife. The dominant trees on this soil are knobcone pine, chinkapin and madrone.

Unit 521 soils are unproductive for Douglas fir. They are classed as Low Site (Non-Forest) for timber production. The timber site Class for Douglas fir is generally less than V. The available water holding capacity is low. The soils are usually moist and are dry between 4 and 12 inches for more than 45 consecutive days during the dry summer season.

Permeability is moderately rapid. Runoff is medium to rapid. Erosion hazard generally is severe. Landslide hazard is moderate to severe.

Unit 521 soils are poor sources of material for subgrade of roads because of slope, packing difficulty and piping hazard. Water bars should be constructed along temporary roads and trails to prevent accumulation of water.

Wildlife habitat suitability is generally good for openland wildlife and poor for woodland wildlife. Unit 520 soils are generally unsuitable as potential habitat for wetland wildlife.

Unit 521 soils have severe limitations as potential sites for septic tank absorption fields, sanitary landfills, buildings and camp areas because of slope and shallow depth to bedrock.

Mapping Units: Unit 521 soils are not dominant in any of the mapping units. They are secondary soils in mapping units of the Unit 520 and Unit 524 soils and inclusions in mapping units of the Dement and Unit 530 soils.

(524) Unnamed Unit 524 Series

The Unit 524 series consists of deep brown, fine-loamy soils that have a very thick surface layer. They are formed in colluvium and residuum from graywacke in areas receiving from 60 to 100 inches of precipitation. They occur on gently sloping to steep ridgetops, sideslopes, and slump benches in mountainous uplands of southern coastal Oregon.

Profile Description: Unit 524 Gravelly Loam

Surface layer:	0-22"	Dark brown, gravelly loam, very friable, very strongly acid. 20 to 30 inches thick.
Subsoil:	22-50"	Strong brown, gravelly silty clay loam, friable, strongly acid. 18 to 36 inches thick.
Substratum	50"+	Weathered, fractured graywacke.

Representative Profile: Curry County, Oregon. SE 1/4, NE 1/4, Section 19, T. 39 S., R. 13 W. In north cutbank of logging road.

Variations: Depth to bedrock is 40 to 60+ inches. Rock fragment content is between 0 and 40 percent for the surface layer, and between 5 and 30 percent for the subsoil. The soil reaction is strongly acid or very strongly acid. the color of the surface layer is dark brown, very dark brown, or very dark grayish brown. The texture of the surface layer is loam, silt loam, or light clay loam. The color of the subsoil is dark brown, dark yellowish brown, brown, yellowish brown, or strong brown. The texture is loam, light clay loam, light clay loam, light silty clay loam, or gravelly light clay loam.

Setting: The Unit 524 soils are on gently sloping to steep ridgetops, sideslopes, and slump benches in mountainous uplands at elevations of 200 to 2,800 feet. Slope gradients range from 10 to 60 percent. The Unit 524 soils formed in colluvium and residuum weathered from graywacke members of the Dothan formation. The climate is a mild, humid marine type, with a mean annual precipitation of 60 to 120 inches, and a dry summer period of less than 45 days. The mean annual temperature is about 52°F.; the average January temperature is about 47°F.; and the average July temperature is about 60°F. The frost-free period is about 220 days. The native vegetation is a Douglas fir and tanoak canopy, with an understory of rhododendron, salal, evergreen huckleberry, sword fern, and bracken fern.

Unit 524 soils are associated with the deep, red, clayey soils of the Dement series from graywacke; the moderately deep, loamy-skeletal Unit 530 soils from graywacke; and the moderately deep, loamy-skeletal Unit 521 soils and deep, fine-loamy Unit 520 soils from old volcanic rocks.

Soil Behavior: The Unit 524 soils are used for timber production, water supply, farming, and by wildlife. The dominant trees on this soil are Douglas fir and tanoak.

Soil productivity for Douglas fir is moderate. The timber site Class is usually III. The soils are also high site for merchantable tanoak production. The available water holding capacity is high. The soils are usually moist and are dry between 4 and 12 inches for less than 45 consecutive days during the dry summer season.

Permeability is moderate. Runoff is medium to rapid. Erosion hazard is moderate on slopes of 10 to 35 percent and severe on slopes that exceed 35 percent. Cutbanks that exceed 10 feet in depth generally are unstable due to low shear strength, seepage force and severe piping hazard.

Seedling mortality hazard is slight to moderate. Plant competition from brush and tanoak is generally severe. The windthrow hazard is moderate. The compaction hazard is moderate. The landslide hazard is severe on slopes that exceed 35 percent. Road maintenance is expensive because of numerous drainages and uneven microrelief. Slopes that exceed 35 percent are too steep for the safe operation of tractors.

Unit 524 soils are poor sources of material for the subgrade of roads because of slope, poor hearing capacity, packing difficulty, severe piping hazard and inherent drainage characteristics. Water bars should be constructed to prevent the accumulation of water along temporary roads and trails. Constructed heliponds require linings to prevent excessive seepage losses due to slope and moderate permeability. The burning hazard for Unit 524 soils is slight.

Wildlife habitat suitability is generally fair to good for openland wildlife and good for woodland wildlife. Tanoak acorns are a major source of food for the feral hogs of Curry County, squirrels and other species of rodents. The seeps and flowing springs associated with these soils are good sources of water for big game and birds. Unit 524 soils are poor as potential habitat for wetland wildlife.

Mapping Units:

524/XW Unit 524 loam, 10 to 60 percent slopes. 680 acres. This mapping unit is predominantly deep, fine-loamy, thick-surface layered, Unit 524 soils on moderately sloping to steep ridgetops, sideslopes and slump benches. About 70 percent of the slopes have gradients between 35 and 60 percent, and about 30 percent have gradients between 10 and 35 percent. Mingled with the Unit 524 soils are minor inclusions of Dement soils on the ridgetops, and of Unit 530, Unit 520, and Unit 521 soils on the slump benches and sideslopes.

524-530-R/XW Unit 524 loam - Unit 530 gravelly loam - Rock land association 10 to 60 percent slopes. 1780 acres. Deep loamy, thick-surface layered Unit 524 soils make up about 50 percent of the area; moderately deep, brown, loamy-skeletal Unit 530 soils make up about 30 percent of the area; and Rock land makes up about 20 percent of the area. The Unit 524 soils are mostly on slump benches and ridgetops. The Unit 530 soils are mostly on steep sideslopes. About 70 percent of the slopes have gradients between 35 and 60 percent and about 30 percent of the slopes have gradients between 10 and 35 percent. Mingled with the Unit 524 soils are minor inclusions of Dement and Unit 520 soils. Mingled with the Unit 530 soils and Rock land are minor inclusions of Unit 521 soils.

(530) Unnamed Unit 530 Series

The Unit 530 series consists of moderately deep, brown, loamy-skeletal soils formed in colluvium and residuum from graywacke in areas receiving from 60 to 80 inches of precipitation. They occur on moderately steep to steep ridgetops and sideslopes in mountainous uplands of southern coastal Oregon.

Profile Description: Unit 530 gravelly loam.

Surface soil:	0-11"	Very dark grayish brown gravelly loam, friable, very strongly acid. 8 to 14 inches thick.
Subsoil:	11-33"	Yellowish brown, very gravelly loam, friable, very strongly acid. 12 to 30 inches thick.
Substratum:		Weathered, fractured graywacke.

Representative Profile: NE 1/4, Section 11, T. 39 S., R. 13. W.

Variations: Depth to bedrock is 20 to 40 inches. Rock fragment content is between 15 and 50 percent in the surface layer; and between 35 and 75 percent in the subsoil. The soil reaction is strongly acid or very strongly acid. The color of the surface layer is very dark grayish brown, very dark brown, or dark brown. The texture of the surface layer is gravelly loam or gravelly silt loam. The color of the subsoil is yellowish brown, dark yellowish brown, brown, or strong brown. The texture of the subsoil is very gravelly loam or very gravelly light clay loam.

Setting: The Unit 530 soils are on moderately steep to steep ridgetops and sideslopes in mountainous uplands at elevations of 200 to 2,800 feet. Slope gradients are mostly between 35 and 60 percent. The Unit 530 soils formed in colluvium and residuum weathered from graywacke members of the Dothan formation. The climate is a mild, humid marine type with a mean annual precipitation of 60 to 80 inches, and a dry summer period of at least 45 days. The mean annual temperature is about 52°F.; the average January temperature is about 47°F; and the average July temperature is about 60°F. The frost-free period is about 220 days. The native vegetation is a Douglas fir, tanoak and madrone canopy with an understory of rhododendron, salal, ocean spray and evergreen huckleberry.

Unit 530 soils are associated with the deep, red, clayey Dement soils from graywacke; the deep, brown, thick-surface layered, fine-loamy Unit 524 soils from graywacke; deep red loamy Unit 520 soils from old volcanic rocks; and moderately deep, red, loamy-skeletal Unit 521 soils from old volcanic rocks.

Soil Behavior: The Unit 530 soils are used for timber production, water supply and by wildlife. The dominant trees on this soil are Douglas fir, tanoak, chinkapin and madrone.

Soil productivity for Douglas fir is low. The timber site Class is usually IV+. The available water holding capacity is low. The soils are usually moist but are dry between 4 and 12 inches for more than 45 consecutive days during the dry summer season.

Permeability is moderately rapid. Runoff is medium to rapid. Erosion hazard is moderate to severe. Landslide hazard is slight to moderate. Cutbanks and road beds are usually stable.

Seedling mortality is severe on slopes with south and west exposures and moderate on slopes with north and east exposures. Plant competition from brush and tanoak is severe. Windthrow hazard is slight or moderate. The compaction hazard is slight. The use of equipment is limited because rock outcrops are common and drainages are numerous. Slopes that exceed 35 percent are too steep for the safe operation of tractors.

Unit 530 soils are poor sources of material for the subgrade of roads because of slope, packing difficulty, moderately shallow depth to bedrock, and severe piping hazard. Water bars should be constructed to prevent the accumulation of water along temporary roads and trails. Constructed heliponds require linings to prevent excessive seepage losses due to slope and moderately rapid permeability. The burning hazard for Unit 530 soils is slight on slopes with north and east exposures and severe on south and west facing slopes.

Wildlife habitat suitability is generally very poor for openland wildlife due to encroachment of dense brushfields. Habitat suitability is generally fair to good for woodland wildlife. Unit 530 soils are very poor as potential habitat for wetland wildlife. These soils are a prime source of spawning gravels for salmonids downstream.

Mapping Units:

530-R/X — Unit 530 gravelly loam - Rock land association, 35 to 60 percent slopes. 2880 acres. The moderately deep, brown, loamy-skeletal Unit 530 soils make up about 70 percent of the area; and Rock land makes up about 30 percent of the area. The Unit 530 soils are mostly on steep sideslopes and narrow ridgetops. The Rock land is mostly on sharp ridgecrests and small isolated rocky hills. Mingled with the Unit 530 soils are minor inclusions of Dement and Unit 524 soils.

530-524-R/XW — Unit 530 gravelly loam - Unit 524 loam - Rock land association, 10 to 60 percent slopes. 1590 acres. The moderately deep, loamy-skeletal Unit 530 soils make up about 50 percent of the area; the deep, thick-surface layered, loamy Unit 524 soils make up about 30 percent of the area; and Rock land makes up about 20 percent of the area. The Unit 530 soils are mostly on steep sideslopes and narrow ridgetops. The Unit 524 soils are mostly on slump benches and broad ridgetops. The Rock land is mostly on steep slump escarpments. About 70 percent of the slopes have gradients between 35 and 60 percent, and about 30 percent have gradients between 10 and 35 percent.

Mingled with the Unit 530 and 524 soils are minor inclusions of Dement soils on the ridgetops and smooth sideslopes; and of Unit 521 soils on steep dissected sideslopes.

530-540-R/X Unit 530 gravelly loam - Dement silt loam - Rock land association, 35 to 60 percent slopes. 810 acres. Moderately deep, loamy-skeletal Unit 530 soils make up about 50 percent of the area; deep, red, clayey Dement soils make up about 30 percent of the area; and Rock land makes up about 20 percent of the area. The Unit 530 soils are mostly on steep sideslopes. The Dement soils are mostly on broad ridgetops and smooth sideslopes. The Rock land is mostly on the dissected steeper sideslopes. Mingled with the Unit 530 and Dement soils are minor inclusions of Unit 521 soils on south slopes, and of Unit 524 soils on north slopes, and slump benches.

(540) Dement Series

The Dement series consists of deep, well drained, red, clayey soils formed in colluvium weathered from sedimentary rocks in areas receiving between 55 and 100 inches of precipitation. They occur on gently sloping to very steep foothills and ridges in Curry County and the southern part of Coos County.

Profile Description: Dement Silt Loam.

Surface soil:	0-8"	Dark reddish brown silt loam, friable, strongly acid. 6 to 10 inches thick.
Subsoil:	8-45"	Yellowish red, heavy silty clay loam, firm, strongly acid. 34 to 45 inches thick.
Substratum:	45"+	Highly fractured and weathered siltstone.

Representative Profile: Along the north side of the Coquille-Fairview Road, 200 feet north and 300 feet west of the south quarter corner in section 30, T. 27 S., R. 12 W.

Variations: Depth to soft siltstone or graywacke is from 40 to 60 inches. Rock fragment content ranges from 0 to 10 percent. The color of the surface soil is dark reddish brown, reddish brown, dark brown, or brown. The texture of the surface soil is silt-loam, or loam. The color of the subsoil is yellowish red, reddish yellow, or red. The texture of the subsoil is light silty clay or heavy silty clay loam.

Setting: Dement soils are on gently sloping to very steep marine terraces, foothills, and mountainous ridges along southwestern Oregon Valleys at elevations of 20 to 1,000 feet. Slope gradients range from 10 to 60 percent. The soils formed in colluvium weathered from siltstone,

and graywacke members of the Dothan formation. The climate is cool and moist with a mean annual precipitation of 55 to 70 inches; a mean annual temperature of 52°F.; an average January temperature of 44°F.; and an average July temperature of 60°F. The frost-free period is about 220 days.

Native vegetation consists of a coniferous forest canopy dominated by Douglas fir, western hemlock western red cedar, tanoak, and red alder. The understory is mixed shrubs and forbs, such as, evergreen huckleberry, ocean spray, poison oak, madrone, and manzanita.

Dement soils are associated with the moderately deep, loamy-skeletal Unit 530 soils from weathered graywacke; the deep, thick-surface layered, fine-loamy Unit 524 soils from graywacke; the deep, red, fine-loamy Unit 520 soils from volcanic rocks; the moderately deep, red, loamy-skeletal Unit 521 soils from volcanic rocks, and rock land.

Soil Behavior: The Dement soils are used for timber production, farming, recreation, home sites, water supply and by wildlife. The dominant trees are Douglas fir, western hemlock, western red cedar, tanoak and red alder.

Soil productivity for Douglas fir is moderate. The timber site Class is generally III. The available water holding capacity is high. The soils are usually moist and are dry between 4 and 12 inches for less than 45 consecutive days during the dry summer season.

Permeability is moderately slow. Runoff is slow to rapid. Erosion hazard is moderate on slopes of 10 to 35 percent and severe on slopes that exceed 35 percent. Cutbanks that exceed 15 feet in depth are generally unstable because of low shear strength.

Seedling mortality is slight. Plant competition from brush, alder and tanoak is severe, especially within the fog belt. The windthrow hazard is slight. The compaction hazard is severe. The limitation for grading in the winter is severe because of the high plasticity when wet. Slopes exceeding 35 percent are too steep for the safe operation of tractors. Tractor logging, gross yarding and scarification are generally unsuitable management practices on these soils due to excessive site damage. Cable logging systems with one end or full suspension capability are generally quite suitable for use in logging operations on these soils. Burning hazard is slight on these soils.

Dement soils are poor sources of material for the subgrade of roads because of low bearing capacity and severe piping hazard. Roads need extra material for base stabilization and surfacing. Because of small slumps, maintenance needs are greater on slopes exceeding 10 percent. Water bars need to be constructed to prevent the accumulation of water along temporary roads and trails. Heliponds constructed on this soil should have linings included in the design.

Wildlife suitability generally is good for openland wildlife and woodland wildlife. Suitability is very poor as potential habitat for wetland wildlife.

Septic tank absorption fields, sanitary landfills, camp areas, playgrounds and buildings have severe limitations on these soils due to slope, moderately slow permeability, depth to bedrock and moderate shrink-swell.

Mapping Units:

540-524-530/XW Dement silt loam - Unit 524 loam - Unit 530 gravelly loam association, 10 to 60 percent slopes. 524 acres. Deep, red, clayey Dement soils make up about 50 percent of the area; deep, thick surface layered, loamy Unit 524 soils make up about 30 percent of the area; and moderately deep, loamy-skeletal Unit 530 soils make up about 20 percent of the area. The Dement soils are mostly on broad ridgetops and smooth sideslopes. The Unit 524 soils are mostly on steep sideslopes. The Unit 530 soils are mostly on slump benches. About 70 percent of the slopes have gradients between 35 and 60 percent, and about 30 percent have gradients between 10 and 35 percent. Mingled with the Dement soils are minor inclusions of Unit 520 soils. Mingled with the Unit 530 soils are minor inclusions of Unit 521 soils.

540-530-R/XW Dement silt loam - Unit 530 gravelly loam - Rock land association, 10 to 60 percent slopes. 1130 acres. Deep, red, clayey Dement soils make up about 50 percent of the area; moderately deep, loamy-skeletal Unit 530 soils make up about 30 percent of the area; and Rock land makes up about 20 percent of the area. The Dement soils are mostly on broad rounded ridgetops, and on slump benches. The Unit 530 soils are mostly on steep sideslopes and on narrow ridgetops. The Rock land is mostly on steep slump escarpments and sharp crests. About 70 percent of the slopes have gradients between 35 and 60 percent, and about 30 percent have gradients between 10 and 35 percent. Mingled with the Dement soils are minor inclusions of Unit 520 and Unit 524 soils. Mingled with the Unit 530 soils are minor inclusions of Unit 521 soils.

540-530-R/X Dement silt loam - Unit 530 gravelly loam - Rock land association, 35 to 60 percent slopes. 2100 acres. Deep, red, clayey Dement soils make up about 50 percent of the area; moderately deep, loamy-skeletal Unit 530 soils make up about 30 percent of the area; and Rock land makes up about 20 percent of the area. The Dement soils are mostly on broad rounded ridgetops and on slump benches.

The Unit 530 soils are mostly on steep sideslopes. The Rock land is mostly on steep slump escarpments and sharp crests. Mingled with the Dement soils are minor inclusions of Unit 520 and Unit 524 soils. Mingled with the Unit 530 soils are minor inclusions of Unit 521 soils.

(557) Etelka Series

The Etelka series consists of deep, moderately well drained soils with clayey subsoils that are formed from colluvium and residuum weathered from old, deeply weathered sedimentary rocks in areas receiving between 60 and 80 inches of precipitation. They occur on convex, gently sloping to steep knobs on ridgetops, and on finger ridges or interfluves on large sideslopes in the Klamath Mountains.

Profile Description:

Surface soil:	0-13"	Dark grayish brown silt loam, friable, strongly acid. 8 to 15 inches thick.
Subsoil:	13-45"	Olive brown silty clay mottled with gray and yellowish brown specks below 32 inches, firm, strongly acid. 25 to 36 inches thick.
Substratum:	45-60"+	Mottled olive brown, gray and strong brown silty clay, firm, medium acid.

Representative Profile: SW 1/4, NW 1/4, SE 1/4, Section 17, T. 315, R. 12 W.

Variations: Depth to hard bedrock is more than 60 inches. The solum is thicker than 40 inches. Hard shiny pebbles and weathered bedrock cobbles make up from 2 to 15 percent of the volume. The color of the surface soil is very dark grayish brown, dark grayish brown, dark olive gray, or olive gray. The texture of the surface soil is silt loam or silty clay loam. The color of the subsoil is olive brown, light olive brown, dark grayish brown, grayish brown, dark brown, or brown. Distinct to prominent mottles of low and high chromas are below 24 to 40 inches. The texture of the subsoil is silty clay or heavy silty clay loam. The substratum is similar to the subsoil with respect to color and mottling. The texture is silty clay loam, silty clay, or clay.

Setting: The Etelka soils are on convex gently sloping to steep knobs on ridgetops, ridge noses and finger ridges or interfluves of large sideslopes at elevations of 200 to 1,800 feet. Slope gradients range from 10 to 60 percent. The soils formed in fine and moderately fine colluvium and residuum weathered from highly fractured and intensely sheared, deeply weathered gray siltstone and graywacke of the Otter Point formation. The climate is marine, having an annual precipitation of 60 to 80 inches, with a dry season during the summer. The mean

annual temperature is 52°F.; the average January temperature is about 43°F.; and the average July temperature is about 62°F. The frost-free period is about 190 days. Native vegetation is a coniferous tree canopy dominated by Douglas fir, grand fir, hemlock, and western red cedar. The understory is mixed shrubs and forbs, such as, salal, red huckleberry, rhododendron, gooseberry, salmonberry, manzanita, and sword fern. Wild iris and tansy ragwort occur in cut-over areas.

Etelka soils are associated with the deep, somewhat poorly drained Whobrey soils; the deep loamy Preacher soils; the moderately deep, loamy Bohannon soils, and the moderately deep, loamy-skeletal Digger soils.

Soil Behavior: The Etelka soils are used for timber production, water supply, recreation, farming, homesites and by wildlife. The dominant trees are Douglas fir, grand fir, western hemlock, western red cedar, Port Orford cedar and red alder.

Soil productivity for Douglas fir is high. The timber site Class is generally II. The available water holding capacity is high. The soils are usually moist and are dry between 4 and 12 inches for less than 45 consecutive days during the dry summer season.

Permeability is slow. Runoff is medium to rapid. Erosion hazard and landslide hazard are moderate on slopes of 10 to 35 percent and severe on slopes of 35 to 60 percent. Cutbanks that exceed 5 feet in depth are highly unstable due to low shear strength and high shrink-swell characteristics. Figure 29 shows cutbank slope failure that occurred within one year after construction. Cutbanks are approximately 4 feet in height.

Seedling mortality is slight. Plant competition from brush and alder is severe. The windthrow hazard is moderate to severe. The compaction hazard is moderate to severe. Tractor logging, gross yarding and scarification are generally unsuitable management practices on these soils due to excessive site damage. Cable systems with one end or full suspension capability are generally most suitable for use in logging operations on these soils. Burning hazard is slight.

Etelka soils are poor sources of material for the subgrade of roads because of low shear strength, high shrink-swell, and low compressibility. Roads need extra material for base stabilization and surfacing. Special drainage designs and special road designs are usually required to minimize watershed damage on these soils. Special road design may include the use of pilings to support trestles (See figure 30). Road fill failures are very frequent due to very poor bearing capacity. Figures 31 and 32 illustrate the use of rock ballast for stabilization of bearing capacity failure. Midslope terrain should be avoided as site locations for roads on these soils. Water bars should be constructed along temporary roads and trails to prevent the accumulation of water and severe gully erosion.

Figure 29 Slope failure and resultant severe rill erosion along road cutbank slope in Etelka (557) and Whobrey (501) soils of Otter Point Formation.

Figure 30 Fifty year old pilings of Port Orford Cedar used to provide support for old logging railroad trestles located in tributary drainage headwalls of Baker Creek along BLM access road in the Otter Point Formation.

Figure 31 Rock ballast placed along the toe of cutbank slope for stabilization of road cutbank in the Otter Point Formation.

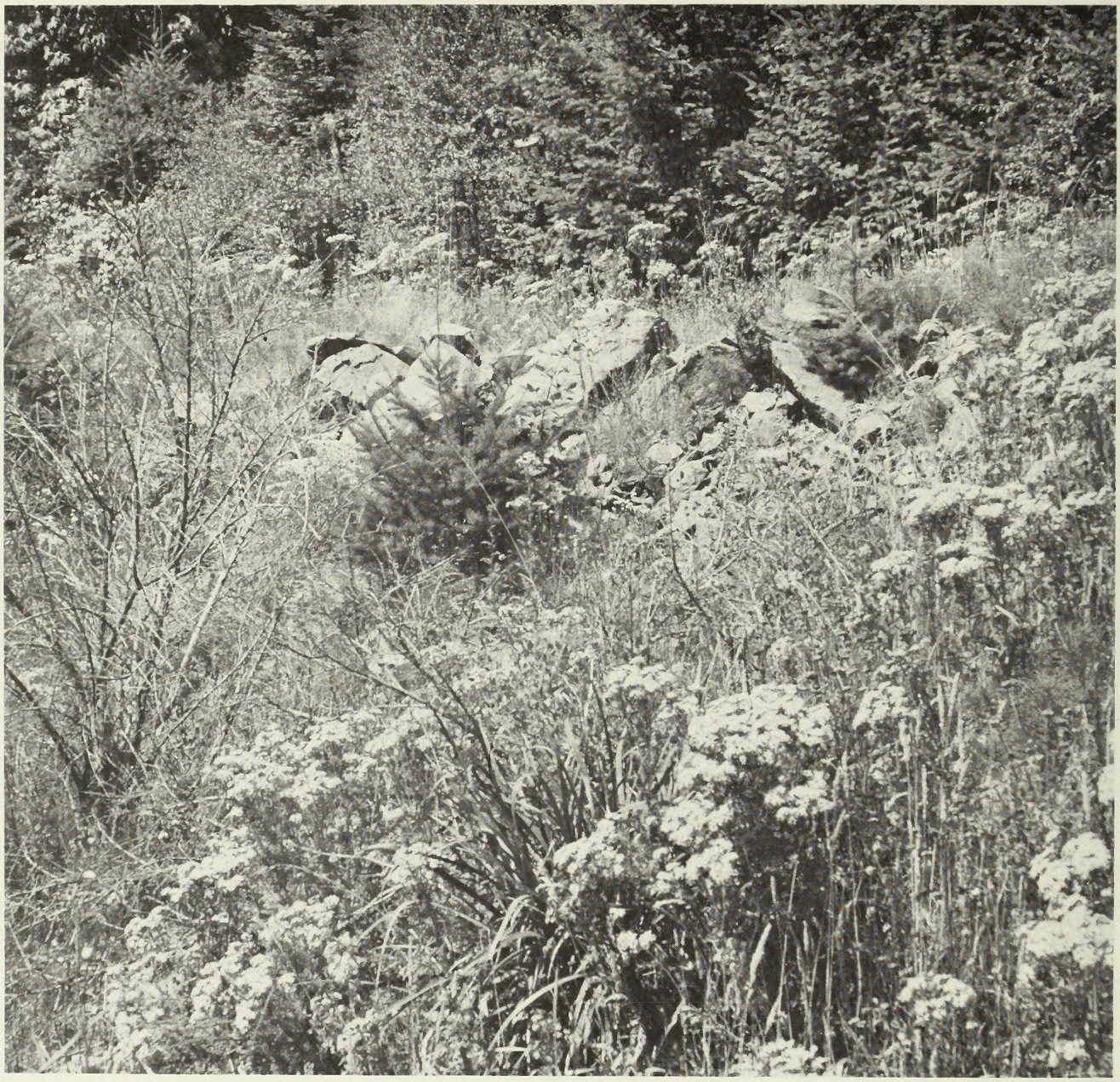

Figure 32 Rock ballast used in the stabilization of bearing capacity failures at the head of an upslope drainageway in Whobrey (501) soils of the Otter Point Formation.

Wildlife habitat suitability is generally poor to fair for openland wildlife and good for woodland and rangeland wildlife. Upland birds and big game frequent the seeps and flowing springs associated with these soils. Etelka soils are very poor as potential habitat for wetland wildlife.

Septic tank absorption fields and sanitary landfills constructed on Etelka soils would have severe limitations due to slow permeability, slope, high shrink-swell, and drainage characteristics of these soils. Potential building sites should be examined on-site for suitability.

Rock outcrop inclusions (known as pods) often are associated with Etelka soils. These Pods are often good sources of quarry material. Generally, these materials consist of blueschist, chert, greenstone or altered volcanic rocks.

Mapping Units:

557-66-501/XY Etelka silt loam - Digger gravelly loam - Whobrey silt loam association, 35 to 80 percent slopes. 230 acres. Deep, moderately well drained, Etelka soils make up about 40 percent of the area; moderately deep, skeletal Digger soils make up about 35 percent of the area; and deep, somewhat poorly drained Whobrey soils make up about 25 percent of the area. The Etelka soils are mostly on steep convex ridgetops and ridge noses. The Digger soils are mostly on very steep, small hills underlain by schist, called "pods". The Whobrey soils are mostly in saddles and on slump benches. About 70 percent of the slopes have gradients between 35 and 60 percent, and about 30 percent have gradients between 60 and 80 percent. Mingled with the Etelka soils are minor inclusions of Preacher and Bohannon soils. Mingled with the Digger soils are minor inclusions of Jason and Umpcoos soils and Rock land.

557-501/W Etelka silt loam - Whobrey silt loam association, 10 to 35 percent slopes. 110 acres. Deep, moderately well drained, Etelka soils make up about 60 percent of the area; and deep, somewhat poorly drained Whobrey soils make up about 40 percent of the area. The Etelka soils are mostly on convex knobs on ridgetops, and on smooth upper parts of sideslopes and finger ridges. The Whobrey soils are mostly in concave saddles on ridgetops, and on uneven lower parts of sideslopes. Mingled with the Etelka soils are minor areas of Blachly soils and Preacher soils on ridgetops, and of Digger soils on the steeper finger ridges.

557-501/WX Etelka silt loam - Whobrey silt loam association, 10 to 60 percent slopes. 400 acres. Deep, moderately well drained Etelka soils make up about 60 percent of the area; and deep, somewhat poorly drained Whobrey soils make up about 40 percent of the area. The Etelka soils are mostly on convex knobs on ridgetops, and on smooth upper parts of sideslopes. The Whobrey soils are mostly in concave saddles on ridgetops, and on uneven lower parts of sideslopes. About 70 percent of the slopes have gradients between 10 and 35 percent, and about 30 have gradients between 35 and 60 percent. Mingled with the Etelka soils are minor areas of Blachly soils on ridgetops; of Preacher soils on sideslopes and of Digger soils on the steeper finger ridges.

557-501/XW Etelka silt loam - Whobrey silt loam association, 10 to 60 percent slopes. 500 acres. Deep, moderately well drained Etelka soils make up about 70 percent of the area; and deep, somwhat poorly drained Whobrey soils make up about 30 percent of the area. The Etelka soils are mostly on convex knobs on ridgetops, and on steep, smooth upper parts of sideslopes. The Whobrey soils are mostly in concave saddles on ridgetops and on uneven sideslopes. About 70 percent of the slopes have gradients between 35 and 60 percent and 30 percent of the slopes have gradients between 10 and 35 percent. Mingled with the Etelka soils are minor inclusions of Preacher soils on the ridgetops and of Digger an Bohannon soils along slope breaks and on ridgenoses.

557-501-66/X Etelka silt loam - Whobrey silt loam - Digger gravelly loam association, 35 to 60 percent slopes. 590 acres. Deep, moderately well drained Etelka soils make up about 50 percent of the area; deep, somewhat poorly drained Whobrey soils make up about 30 percent of the area; and moderately deep, loamy skeletal Digger soils make up about 20 percent of the area. The Etelka soils are mostly on convex knobs on ridgetops and on smooth upper parts of sideslopes. The Whobrey soils are mostly in concave saddles on ridgetops and on uneven lower parts of sideslopes. The Digger soils are on the steeper sideslopes of ridges and small hills, locally called pods, that are underlain by schist. Mingled with the Etelka soils are minor inclusions of Preacher and Bohannon soils. Mingled with the Digger soils are minor inclusions of Jason soils and Rock land on the "pods".

(564) Umpcoos Series

The Umpcoos series consists of shallow, somewhat excessively drained, loamy-skeletal soils formed in colluvium weathered from sandstone. The underlying sandstone is hard and only slightly fractured. These soils are on very steep and extremely steep mountainous sideslopes and headwall of drainage ways in areas of the coast range receiving between 60 to 100 inches of precipitation.

Profile Description: Umpcoos very gravelly sandy loam.

Surface soil:	0-3"	Dark grayish brown, very gravelly, sandy loam, very friable, medium acid. 2 to 5 inches thick.
Subsoil:	3-16"	Brown very gravelly, sand loam, very friable, medium acid. 8 to 18 inches thick.
Substratum:	16"+	Consolidated sandstone.

Representative Profile: 1,000 feet west of the NE corner of Section 17, T. 27 S., R. 10 W.

Variations: Depth to hard consolidated bedrock, or lithic contact, is 10 to 20 inches. Rock fragment contact ranges from 35 to 50 percent pebbles and 0 to 25 percent cobbles. The color of the surface layer is dark brown, brown, very dark grayish brown, or dark grayish brown. The texture of the surface layer is very gravelly sandy loam or very gravelly loam. The color of the subsoil is dark brown, brown, dark grayish brown, or grayish brown. The texture of the subsoil is very gravelly sandy loam, very gravelly loam, or cobbly loam.

Setting: Umpcoos soils are on steep to extremely steep sideslopes, headwalls, and sharp narrow ridgetops at elevations of 500 to 2,000 feet. Slope gradients range from 50 to 110 percent. The soils formed in colluvium weathered from sandstone and siltstone of the Tyee and Flournoy formations. The climate is cool and moist with a mean annual precipitation of 60 to 100 inches; a mean annual temperature of 50°F.; an average January temperature of 42°F.; and an average July temperature of about 58°F. The average frost-free period is about 170 days. Native vegetation consists of a coniferous tree canopy dominated by Douglas fir, myrtlewood, and incense cedar. The understory is mixed shrubs and forbs, such as ocean spray, evergreen huckleberry, poison oak, Oregon grape, madrone, and manzanita.

Umpcoos soils are associated with the shallow, loamy-skeletal Jason soils that have a paralithic contact; the moderately deep, loamy-skeletal Digger soils; the moderately deep, fine-loamy Bohannon soils, and Rock land.

Soil Behavior: The Umpcoos soils are used for timber production, water supply, recreation and by wildlife. The dominant trees are Douglas fir, incense cedar, Oregon myrtle, big leaf maple and red alder.

Soil productivity for Douglas fir is very low. The timber site Class is usually IV or V. The available water holding capacity is very low. The soils are usually moist and are dry between 4 and 12 inches for less than 45 consecutive days during the dry summer season.

Permeability is moderately rapid. Runoff is medium to rapid. Erosion hazard and landslide hazard are both severe. Waste materials are a problem in road construction when they are sidecast along pioneer roads or roads of minimum width design. They cause landslides. Ridgetops are generally very narrow and suitable waste areas for disposal of endhaul materials usually are not available. Sideslopes in the terrain represented by these soils are highly unstable.

Seedling mortality is severe. Plant competition from brush and alder is severe, especially within the fog belt. The windthrow hazard is severe. The compaction hazard is slight.

Terrain is a severe limitation to most management operations. The use of equipment is limited because slopes are usually very steep or extremely steep and rock outcrops are very common. These soils are not suited for intensive forest land management. On slopes exceeding 60 percent, full suspension capability systems are generally most suitable for the yarding of logs, provided deflection is adequate. On slopes exceeding 80 percent, aerial logging systems may be the most suitable. Practices such as thinning, planting and cruising are difficult and hazardous due to steepness of terrain and associated rock faces. The burning hazard is severe.

Umpcoos soils are poor sources of material for subgrade of roads due to slope, depth to bedrock, packing difficulty and severe piping hazard. Shallow depth to bedrock is a severe limitation as sites for road locations. Dry ravel scree slopes and loss of plant nutrients usually result when roads are located and constructed on these soils. Controlled blasting is generally a technique employed to prevent the sidecasting of coarse materials in the construction of "pioneer" roads. Water bars should be constructed along temporary roads and trails to prevent channelling. In many places timber harvest has been indefinitely deferred and the land is reserved as watershed protection areas because of low productivity, landslide hazard, erosion hazard, and regeneration hazard.

Wildlife habitat suitability is generally poor or fair for openland wildlife and good for woodland wildlife. Umpcoos soils are very poor as potential habitat for wetland wildlife.

Depth to bedrock and slope are severe limitations to the selection of sites for septic tank absorption fields, sanitary landfills, campgrounds, buildings, and playgrounds.

Mapping Units

564-R/ZY Umpcoos very gravelly sandy loam--Rock land association, 60 to 120 percent slopes. 13,170 acres. Shallow, skeletal Umpcoos soils make up about 60 percent of the area; and Rock land makes up about 40 percent of the area. The Umpcoos soils are mostly on very steep sideslopes and on narrow ridgetops. The Rock land is mostly on extremely steep headwalls and rim-like escarpments of the Tyee sandstone. About 70 percent of the slopes have gradients between 80 and 120 percent, and about 30 percent have gradients between 60 and 80 percent. Mingled with the Umpcoos soils are minor inclusions of Jason and Digger soils. Mingled with the Rock Land are small areas of rock outcrop.

(580) Edson Series

The Edson series consists of deep, red, clayey soils formed in colluvium and residuum weathered from schist in areas receiving from 60 to 100 inches of precipitation. They occur on gently sloping to steep uplands in southern coastal areas of Oregon.

Profile Description: Edson clay loam

Surface soil:	0-6"	Reddish brown, clay loam, friable, strongly acid. 4 to 8 inches thick.
Subsoil	6-46"	Reddish brown, silty clay, firm, strongly acid. 36 to 50 inches thick.
Substratum:	46-60"+	Yellowish brown, silty clay loam, firm, very strongly acid.

Representative Profile: 1320 feet north of the S 1/4 corner of section 35, T. 34 S., R. 14 W.

Variations: Depth to bedrock is 40 to 60 or more inches. Rock fragment content ranges from 0 to 10 percent in the lower solumn. The solumn ranges from strongly to very strongly acid. The color of the surface soil is reddish brown, dark reddish brown, dark brown, or brown. The texture of the surface horizon is clay loam, loam, or silt loam. The color of the subsoil is dark reddish brown, dark red, reddish brown, red, or yellowish red. The texture of the subsoil is silty clay or clay. The color of the substratum is yellowish brown, dark yellowish brown, strong brown, or brown. Its texture is silty clay loam or silty clay . Clay films range from few to common and thin to moderately thick in the subsoil.

Setting: Edson soils occur on ridgetops and sideslopes in mountainous topography at elevations of 200 to 2,800 feet. Slope gradients range

from 10 to 60 percent. The soils formed in colluvium and residuum weathered from schist and schistose slate of the Colebrook formation. The climate is a mild, humid, marine-type, with a mean annual precipitation of 60 to 100 inches, and a dry summer period of less than 45 days. The mean annual temperature is about 50° to 52°F.; the average January temperature is about 45oF.; and the average July temperature is about 59°F. The frost-free period is about 220 days. The native vegetation consists of a coniferous forest canopy dominated by Douglas fir, western hemlock, and tanoak. the understory consists of salal, rhododendron, evergreen huckleberry and sword fern.

Edson soils are associated with the moderately deep, brown, loamy-skeletal Unit 505 soils from schist; the deep, red, fine-loamy Unit 520 soils from volcanic rocks; and the deep, red, clayey Unit 503 soils from serpentine and peridotite; and with rock land.

Soil Behavior: The Edson soils are used for timber production, water supply, and by wildlife. The dominant trees are Douglas fir, western hemlock, tanoak and madrone.

Soil productivity for Douglas fir is moderate. The timber site Class is usually III-. The available waterholding capacity is high. The soils are usually moist and are dry between 4 and 12 inches for less than 45 consecutive days during the dry summer season.

Permeability is moderately slow. Runoff is medium to rapid. Erosion hazard is slight to severe. Cutbanks that exceed 15 feet in depth are unstable due to low shear strength.

Seedling mortality is slight on east and north slopes and moderate on south and west slopes and on the upper segments of slopes. Plant competition from brush and alder is generally severe. Windthrow hazard is slight. The compaction hazard is severe. The limitation for grading in winter is severe because of the high plasticity when wet. Slopes exceeding 35 percent are too steep for the safe operation of taactors. Tractor logging, gross yarding and scarification are management practices generally unsuited to these soils due to the loss of site productivity that results. Cable systems with either one end or full suspension capability are generally best suited for use in logging operations on these soils. Burning hazard is slight on slopes with north and east exposures and severe on south and west facing slopes.

Edson soils are poor sources of material for the subgrade of roads because of moderate shrink-swell, low shear strength, and packing difficulty. Roads need extra material for base stabilization and surfacing. Water bars need to be constructed to prevent the accumulation of water along temporary roads and trails. Heliponds constructed on this soil should have synthetic linings included in the design to prevent high seepage losses.

Wildlife suitability generally is good for openland wildlife and woodland wildlife. Suitability is very poor as potential habitat for wetland wildlife.

Septic tank absorption fields, sanitary landfills and camp areas constructed on Edson soils would have severe limitations on these soils due to slope, moderately slow permeability, moderate shrink-swell, and low shear strength. Potential building sites should be examined on-site for suitability.

Mapping Units:

580/XW — Edson clay loam, 10 to 60 percent slopes. 2190 acres. This mapping unit predominantly consists of deep, red, clayey Edson soils on gently sloping broad ridgetops, and on moderately sloping to steep slump benches and sideslopes. About 70 percent of the slopes have gradients between 35 and 60 percent, and about 30 percent have gradients between 10 and 35 percent. Mingled with the Edson soils are minor inclusions of Unit 505 soils on the steep sideslopes.

580-505/X — Edson clay loam--Unit 505 gravelly silt loam association, 35 to 60 percent clopes. 160 acres. Deep, red, clayey Edson soils make up about 60 percent of the area; and moderately deep, brown loamy-skeletal Unit 505 soils make up about 40 percent of the area. The Edson soils are mostly on rounded ridgetops, uneven slump benches and smooth sideslopes. The Unit 505 soils are mostly on steep, dissected sideslopes and slump escarpments. Mingled with the Edson soils are minor inclusions of Dement and Unit 520 soils. Mingled with the 505 soils are minor inclusions of Unit 521 soils and Rock land.

580-505-R/X — Edson clay loam--Unit 505 gravelly silt loam--Rock land association, 35 to 60 percent slopes. 560 acres. Deep, red, clayey Edson soils make up about 50 percent of the area; moderately deep, brown, loamy-skeletal Unit 505 soils make up about 30 percent of the area; and Rock land makes up about 20 percent of the area. The Edson soils are mostly on slump benches and smooth sideslopes. The Unit 505 soils are mostly on steep dissected sideslopes. The Rock land is mainly on steep slump escarpments. Mingled with the Edson soils are minor inclusions of Dement and Unit 520 soils. Mingled with the Unit 505 soils and Rock land are minor inclusions of Unit 521 soils.

(R) Rock Land

Rock Land consists of areas having enough rock outcrops and very shallow soil to submerge other soil characteristics. Rock outcrop covers from 25 to 90 percent of the area. The soils between the rock outcroppings are less than 10 inches thick and generally more than 6 inches thick. Tree growth is sparse and scrubby even where climatic conditions are favorable.

Rock Land occurs on steep to extremely steep headwalls at the source of streams, on very steep to extremely steep sideslopes, on sharp ridge crests, and as rimrock escarpments around plateaus. Hard thick strata of sandstone make up much of the bedorck. Most areas are at relatively high elevations.

Rock land is associated with shallow loamy-skeletal Umpcoos soils with a lithic contact; shallow loamy-skeletal Jason soils with a paralithic contact; moderately deep, loamy-skeletal Digger soils; moderately deep fine-loamy Bohannon soils; deep, fine-loamy Unit 503 soils from serpentinite; moderately deep, loamy-skeletal Unit 505 soils from schist; moderately deep, loamy-skeletal Unit 521 soils from old volcanic rocks; and moderately deep, loamy-skeletal Unit 530 soils from graywacke.

Land-type Behavior: Rock land is used for wildlife habitat and as a source of quarry rock. It is unproductive for the growth of Douglas fir even under favorable climatic conditions. Tree growth, if any, is usually sparse and scrubby.

All land-type properties are highly variable and not ratable. Erosion and landslide hazards are severe. A rock fall hazard is especially severe in areas of Tyee and/or Flournoy sandstone rock outcrops. Regeneration hazard is severe on all slope exposures. Windthrow hazard is severe.

Rock land is highly variable as a source of good quality quarry rock. Each potential quarry site should be examined on-site for suitability. Depth to bedrock and slope gradients are severe limitations to the selection of sites for sanitary facilities, community development facilities, water management facilities and recreation facilities.

R-64/Y Rock land--Jason association, 60 to 80 percent slopes. 1140 acres. Rock land makes up about 60 percent of the area, and Jason soils make up about 40 percent of the area. The Rock land is mostly on very steep headwalls. The Jason soils are mostly on narrow ridge tops and on very steep sideslopes. Mingled with the Rock land are small inclusions of rock outcrop. Mingled with the Jason soils are minor inclusions of Umpcoos and Digger soils.

R-505/X Rock land-Unit 505 gravelly silt loam association, 35 to 60 percent slopes. 180 acres. Rock land makes up about 60 percent of the area, and moderately deep, loamy-skeletal Unit 505 soils make up about 40 percent of the area. The rock land is mostly on steep, isolated hills or monadnocks, and on steep sideslopes of ridges. The Unit 505 soils are mostly on ridgetops. Mingled with the Unit 505 soils are minor inclusions of Edson soils.

C. Soil Formation

This section discusses the factors of soil formation and their effects on the soils in the inventory area. A genetic key is included that relates each soil series to its factors of formation and to major characteristics resulting from the integrated effects of these factors which are significant to classification and to the easy identification of the soils.

1. Factors of Soil Formation

Soils develop specific sets of characteristscs and definite kinds of profiles as a result of the integrated influences of five factors--climate, living organisms, parent material, topography, and time. The relative importance of the factors varies from one soil to another, and in some cases one factor may dominate in the formation of a soil and determine most of its properties. Very young soils, especially, show little influence from climate or vegetation; their characteristics are very much like those of the parent material. In time, weathering and the interaction of the other factors will decrease the relative importance of the parent material. Soils that developed from different kinds of parent material may have similar characteristics if they are old and weathered enough and if they have similar climate, vegetation , and topography.

Commonly, soil-forming factors interact with one another. Topography, for instance, influences the micro-climate; changes in climate causes changes in the kind of and amount of vegetation; so topography, climate, and vegetation may all change together. Different kinds of parent material and topography are related. Topography also influences ground water and soil moisture conditions which affects the kind and amount of vegetation.

Topography - The topography of the area is discussed in Section IV-C, General Characteristics of the Area, under Landforms and Topography.

Differences in elevation or inequalities of the landscape are closely related to differences in: (1) drainage class; (2) rock fragment content: (3) thickness of the solum: (4) horizon differentiation and (5) erosion.

Internal drainage characteristics usually are reflected in the color of the soil, including the degree, depth and type of mottling in the soil profile. Most of the soils in the inventory area are well drained and occupy the sideslopes, ridgcrests and ridgetops. They are usually reddish or brownish and are free of low chroma mottles in their profiles.

The only moderately well drained soils in the area are in the Etelka (557) series that generally occupy steep convex ridgetops and ridgenoses at gradients of 10 to 60 percent in slumping melange terrain of the Otter Point Formation. These soils usually are olive brown or yellowish brown and may have low chroma mottles below about 32 inches, indicating a seasonal fluctuating water table.

The only somewhat poorly drained soils in the area are in the Whobrey (501) series that generally occupy moderately steep to steep, concave, slumping ridgetops and saddles in association with the Etelka series. Whobrey soils generally occur in lower positions than Etelka soils within the landscape at gradients of 10 to 60 percent. These soils are yellowish brown or gray with low chroma matrix colors at 15 to 25 inches below the surface. A low chroma, grayish, dense claypan is at 20 to 25 inches below the surface. This indicates year around saturation due to the presence of a water table.

The only somewhat excessively drained soils in the area are in the shallow, loamy-skeletal Umpcoos 564 series that generally occupy upper positions of very steep and extremely steep sideslopes with gradients between 50 and 110 percent.

The amount and thickness of coarse fragments in the surface layer is related to topographic position. Gravels and rock fragments in the surface layer are most abundant and thickest on ridgecrests and upper positions of sideslopes. The Jason (64), Digger (66), Unit 166, Unit 530, Unit 521, and Umpcoos (564) soils are typical examples of soils that contain large amounts of coarse fragments and rock fragments.

In the Bohannon (63) soils on sideslopes, for example, the amount of gravel and cobbles is much less in quantity and is not as thick as in the Digger (66) and Unit 166 soils of the upper drainages. Generally, coarse fragment and rock fragments are progessively more abundant on the steeper slopes. Soils at lower positions on slopes may contain coarse fragments in appreciable amounts but, frequently, they are buried beneath a variable thickness of gravel-free and cobble-free colluvium.

Topography also influences the thickness of the developed soil (solum) and the degree of horizon differentiation. Soils on very steep slopes characteristically are shallow and lack strong horizon development. This results because the rate of geologic erosion keeps pace with the rate of soil development. On sideslopes with gentler gradients, soil

profiles are progressively thicker, clay content shows an increase and horizon differentiation is more pronounced. The Digger (66) and Preacher (57) series of the Preacher-Digger (57-66) Soil Association provide an example of this relationship. The soils of both series have formed in the same kind of parent materials but the Digger (66) soils are on steeper slopes and have a thinner profile. They lack the strong grade of structure that is characteristic of the Preacher (57) soils. Runoff is slower on gentle slopes than on strong slopes. Therefore, soils in gently sloping terrain have more moisture available to plants and less susceptibility to erosion. The organic matter content generally is greater in soils on gentle slopes.

The topography of the inventory area generally consists of rugged and highly dissected terrain with steep, narrow, V-shaped canyons and dendritic drainage pattern. Elevations range between a few feet to about 3,500 feet above sea level. Sideslopes are short but gradients of 80 to 100 percent are quite common. Slopes with these gradients are highly susceptible to failure (debris avalanche, debris flow and debris torrent) and accelerated surface erosion (Burroughs and Thomas, 1975, 1976; Thomas and Burroughs, 1975; Gresswell, Heller and Minor, 1975).

Parent Material - Parent material is the unconsolidated mass from which a soil develops. It contributes minerals of various kinds and sizes, and affects surface infiltration, permeability, drainage, water-holding capacity, air supply, nutrient supply, and other differences in soil characteristics.

Parent material as a soil forming factor is discussed in considerable detain in Section IV-A, General Characteristics of the Area, under Geology. Table 1 in that section shows the realtionship between the soil series and the parent material.

Climate - Climate conditions for the area are discussed in section IV-B, General Characteristics of the Area, under Climate.

The effects of climate on soil formation are both direct and indirect. Climate expresses itself directly through the effects of (1) moisture (precipitation) and (2) heat energy (temperature) upon the weathering of rocks, the alteration of minerals, and the decomposition of organic matter. Climate expresses itself indirectly by the effects upon biological activity in the soils, growth of vegetation and the leaching and movement of weathered materials.

The inventory area has high annual rainfall, most of which falls in winter and early spring. Temperatures are fairly uniform throughout the year. Freezing temperatures are rare in winter. Summers are cool.

Soil temperatures in the inventory area are seldom high and the soil is seldom frozen. All the soils of the area are classified as mesic, which means that they have mean annual soil temperatures between 8°C. and

15°C. (47oF. and 59°F.). A close relationship exists between mean air temperatures and mean soil temperatures. Usually, the mean soil temperature is about 2°C. warmer than the mean air temperature.

Generally, the soils of the inventory area have a udic mositure regime (dry between depths of 4 and 12 inches for less than 45 consecutive days during the summer). But the Jory series and some soils of Curry County (Units 505, 520, 521 and 530) have a xeric moisture regime (dry between depths of 4 and 12 inches for more than 45 consecutive days during the summer).

Living Organisms - Processes of soil development are greatly modified by vegetation growing on the soil and by animal and plant life living in it. The kind and amount of vegetation that grown on a soil over a long period of time strongly influences the kind, amount and position of the organic matter in the soil. Rodents, worms and insects are natural cultivators of the soil and affect its structure, aeration and drainage.

Vegetation affects soil development in two ways: (1) by modifying the soil climate and (2) by the recycling of nutrients and addition of humus. Forest cover influences the soil climate by intercepting rainfall and by modifying temperature and humidity at the ground level. The tree canopy also absorbs much of the light and heat during the day and radiates heat during the night. Thus, the tree canopy serves to moderate the climate beneath it at ground level and contributes to a soil climate that is less variable than the general climate.

A dense cover of vegetation reduces erosion losses even on sloping topography. The miscellaneous land type, (R) rock land, is very sparsely covered and may always have been essentially bare. Consequently, geologic erosion is keeping pace with weathering and the soil profile never develops or, if so, only very slowly. Shallow soils in the District, such as the Jason (64) series may also be eroding nearly as fast as new material weathers, even on gentle slopes. This is because the shallow, effective rooting zone can only support a sparse cover that offers little protection from erosion. Also, the shallow soils have a low water-holding capacity so that they quickly become saturated and thereby are more subject to runoff than deeper soils.

Vegetation also helps to recycle plant nutrients and, in effect, reduce leaching losses. Nutrients are absorbed by the roots, translocated to the leaves and incorporated into organic matter by metabolic processes. They are returned in the soil through leaf fall and death of entire plants.

Microorganisms, together with insects, fungi and other plant and animal life, aid in decomposing organic matter and in weathering rock material. The mineral forms of nutrients can then be absorbed and the cycle is repeated. An example of recycling by burrowing animals is the mountain beaver, the effects of which is observed readily by its activities on Class II and III+ Douglas fir sites.

Shrubby plants, such as madrone, tan oak, and snowbrush, act as effective "nurse crops" for certain conifer species. They provide shade and protection from deer browse for Douglas-fir seedlings. The encroachment of brush is pronounced within the fog belt along the coast and inland valleys, which is an example of the interaction between climate and vegetation as soil forming factors. The brush vegetation influences the micro-climate of the immediate area and also helps stabilize the steep slopes and shallow soils through the extension of root systems and addition of organic matter. Silvicultural benefits to the growth of Douglas fir by vegetation such as brush and alder have been reported by several research workers (Youngberg; Youngberg and Wollum 1976; Berg and Doerksen, 1975: Scott, 1970). Substantial amounts of nitrogen are contributed to soils from stands of both alder and several species of ceanothus.

Man is a living organism and can cause considerable change to soils. For example, he brings about drastic changes in the vegetation, mixes or moves the upper horizons by harvest and tillage practices, rips dense subsoils to increase permeability, produces an artificial climate through irrigation and physically moves parts of soil by leveling, ditching and road construction.

Time - Time is required for the formation of soil. The amount of time required depends upon the other soil-forming factors. Less time generally is required for a soil to develop in humid, warm regions under dense vegetation than in dry or cold regions under sparse vegetation. Also, less time is required for soil development if the parent material is high in fine grained, basic, weatherable minerals than if it is high in coarse grained, siliceous minerals.

The differentiation of pedogenic soils horizons is related to the length of time that the other soil-forming factors have exerted an influence on the parent material. Generally, older soils show a greater degree of horizon expression than younger soils. For example, on the smoother parts of the gently sloping broad ridgetops of the uplands the soils have developed to maturity (Honeygrove (14) series and Apt (50) series). On steeper slopes geologic erosion has removed soil material as fast as it has formed (Rockland (R)). On floodplains, periodic deposits of new material have prevented the development of distinct horizons (Certain soils of Mixed Alluvial Land (1)).

Corliss (1973) cited work by Balster and Parsons (1966) that calculated the age of soils formed in alluvium on Holocene floodplains in the Coast Range to be as young as 655 to 455 years. The same workers calculated the age of Honeygrove (14) soils that occur on stable surfaces in the Coast Range to be at least 9,570 years old.

Immature soils (weakly developed) have well developed structure in their subsoils, but there has not been a significant enrichment in clay by vertical illuvial translocation. Such horizons are called cambic

horizons. Soils of the Preacher (57), Bohannon (63), Slickrock (54), Whobrey (50) and Etelka (557) have cambic horizons.

Soils with mature profiles have an argillic horizon. These are subsurface horizons having moderate or strong grade of soil structure that are also noticeably higher in clay content than the overlying horizon. Also, there is clear evidence, in the form of clay films on the ped surfaces, that clay has been translocated to the argillic horizon by water percolating through the soil profile. Commonly, mature soils are redder or have stronger chromas than young or immature soils due to a greater degree of oxidation of the iron oxide in the soils. Mature soils usually are more acid than younger soils.

2. Genetic Key for the Soils

Table 8 is a key to the soils of the area that relates each series to major soil properties significant to the classification and use of the soils. Information in Table 8 will be helpful in keying out soils during field studies and in obtaining a quick grasp of the major soil differences in the area.

The diagnostic properties used to identify the soil series in the key are kind of surface soil horizon (epipedon), kind of subsoil horizon, particle-size-class, soil profile depth class, drainage class, and color of the subsoil.

The three kinds of epipedons occuring in the soils of the District are ochric, umbric and pachic. Ochric horizons are relatively light colored, thin, and low in organic matter content. Munsell color values are greater than 3.5 when moist, or 5.5 when dry, or Munsell chromas are greater than 3.5 when moist in an ochric epipedon if it is at least 10 inches thick, or at least one-third the thickness of the solum, if the solum is less than 30 inches thick. Percent base saturation is not diagnostic for ochric horizons and may range from very low values to 100 percent.

Umbric horizons are relatively dark colored, thick, high in organic matter content, and acid. Munsell color values are 3.5 or less when moist, and 5.5 or less when dry, and Munsell chromas are 3.5 or less when moist in an umbric horizon, if it is between 10 and 20 inches thick, or at least one-third the thickness of the solum, if the solum is less than 30 inches thick. The organic matter content is at least 1 percent throughout the surface horizon. The base saturation is less than 50 percent.

Pachic horizons are greater than 20 inches thick, but otherwise similar to an umbric horizon.

Cambic and argillic subsoil horizons differ in degree of development, and kind of development process. The cambic horizons are relatively weakly developed horizons which have not been significantly enriched in clay by illuviation, or by the translocation of clay from the overlying horizon in percolating water. The argillic horizons on the other hand, have been significantly enriched in illuvial clay, and therefore have finer textures than the overlying horizon, and generally have more strongly developed blocky structure than is present in cambic horizons. Clay films coat ped surfaces and line pore walls in argillic horizons. Soils with argillic horizons are generally on old landscape positions that have been stable for thousands of years, and where the rate of geologic erosion losses has been low. Soils with cambic horizons are generally on landscape positions that are unstable and relatively recent, or on slopes where the rate of geologic erosion is nearly equal to the rate of weathering of the underlying parent rock.

The particle-size class refers to grain size distribution of the whole soil, including rock fragments, in contrast to texture, which refers to the grain size distribution of the fraction less than 2 mm in diameter. Particle-size classes present in the soils of this District are: fragmental, loamy-skeletal, fine-loamy, fine-silty, clayey, and fine.

Fragmental soils or horizons are dominated by stones, cobbles or gravel particles, and have too little fine earth particles to fill the pores or interstices larger than 1 mm.

Loamy-skeletal soils are made up of at least 35 percent by volume of rock fragments; are not fragmental; the fine earth has less than 35 percent clay; and the fine earth is neither a sand or loamy sand.

Fine-loamy soils have less than 35 percent rock fragments by volume; between 18 and 35 percent clay in the fine earth fraction, and 15 percent or more by weight of sand and gravel, collectively.

Fine-silty soils are similar to fine-loamy soils, except they have less than 15 percent combined sand and gravel.

Clayey soils are non-skeletal soils (having less than 35 percent rock fragments by volume) which contain more than 35 percent clay in the fine earth fraction.

Fine soils are clayey soils having between 35 and 60 percent clay in the fine earth fraction. Clayey soils may range between 35 and 100 percent in clay content.

TABLE 8. GENETIC KEY FOR THE SOIL SERIES IN THE COOS BAY DISTRICT

Map Symbol	Soil Series	Soil Profile Depth (inches)	Particle Size Class of subsoil	Color of Subsoil	Kind of subsoil horizon	Kind of Epipidon	Underlying Bedrock	Remarks
I Soils in the Coast Range								
564	Umpcoos	10-20	Loamy-skeletal	Brown	Cambic	Ochric	Sandstone	With lithic contact
64	Jason	10-20	Loamy-skeletal	Brown	Cambic	Ochric	Sandstone and Siltstone	With paralithic contact
66	Digger	20-40	Loamy-skeletal	Brown	Cambic	Ochric	Sandstone and Siltstone	
166	Unit 166	40-60+	Loamy-skeletal	Brown	Cambic	Ochric	Sandstone and Siltstone	
63	Bohannon	20-40	Fine-loamy	Brown	Cambic	Umbric	Sandstone and	
57	Preacher	40-60+	Fine-loamy	Brown	Cambic	Umbric	Sandstone and Siltstone	
54	Slickrock	40-60+	Fine-loamy	Brown	Cambic	Pachic	Sandstone and Siltstone	Epipidon is more than 20 inches thick
10	Blachly	40-60+	Fine	Red	Cambic	Ochric	Siltstone and Sandstone	More than 45 percent clay in Cambic B
14	Honeygrove	40-60+	Clayey	Red	Argillic	Umbric	Sedimentary and volcanics	
12	Jory	40-60+	Clayey	Red	Argillic	Umbric	Sedimentary and volcanics	Xeric soils
50	Apt	40-60+	Clayey	Brown	Argillic	Umbric	Siltstone and sandstone	

TABLE 8 (cont'd) GENETIC KEY FOR THE SOIL SERIES IN THE COOS BAY DISTRICT

Map Symbol	Soil Series	Soil Profile Depth (inches)	Particle Size Class of subsoil	Color of Subsoil	Kind of subsoil horizon	Kind of Epipidon	Underlying Bedrock	Remarks
II Soils in the Klamath Mountains								
521	Unit 521	20-40	Loamy-skeletal	Yellowish red	Cambic	Ochric	Volcanic rocks	Xeric soils
520	Unit 520	40-60+	Fine-loamy	Yellowish red	Cambic	Ochric	Volcanic rocks	Xeric soils
530	Unit 530	20-40	Loamy-skeletal	Yellowish red	Cambic	Umbric	Hard gray sandstone	Xeric soils
524	Unit 524	40-60+	Fine-loamy	Brown	Cambic	Pachic	Hard gray sandstone	Udic soils
540	Dement	40-60+	Fine	Red	Cambic	Ochric	Hard gray sandstone	Udic soils, less than 45 percent clay in Cambic horizon
501	Whobrey	40-60+	Fine-silty over fine	Dark gray	Cambic	Ochric	Sheared dark sedimentary rocks	Somewhat poorly drained
557	Etelka	40-60+	Fine	Olive brown	Cambic	Ochric	Sheared dark sedimentary rocks	Moderately well drained
505	Unit 505	20-40	Loamy-skeletal over fragmental	Brown	Cambic	Umbric	Schist and phyllite	Xeric soils
580	Edson	40-60+	Clayey	Red	Argillic	Umbric	Schist and phyllite	Udic soils
503	Unit 503	40-60+	Fine-loamy	Red	Cambic	Ochric	Serpentinite	Udic soils

D. Classification of the Soils

Soils are classified so that we can more easily remember their significant characteristics. Classification enables us to assemble knowledge about the soils, to see their relationship to one another and to the whole environment, and to develop principles that help us to understand their behavior and their response to manipulation. First through classification, and then through use of soil maps, we can apply our knowledge of soils to specific fields and other tracts of land.

Thus in classification, soils are placed in narrow categories that are used in detailed soil surveys so that knowledge about the soils can be organized and used in managing farms, fields, and woodland; in developing rural area; in engineering work, and in many other ways. Soils are placed in broad classes to facilitate study and comparison in large areas, such as countries and continents.

The current system of classification was adopted for general use by the National Cooperative Soil Survey in 1965 (U.S. Dept. of Agriculture, 1960). It is under continual study (U.S. Department of Agriculture Soil Survey Staff, 1975). Therefore, readers interested in developments of the current system should search the latest literature available. In table 9 the soil series of the Coos Bay District are placed in some categories of the current system.

The current system of classification has six categories. Beginning with the broadest, these categories are order, suborder, great group, subgroup, family, and series. The six categories are discussed in the following paragraphs. The soil series in the Coos Bay District are described by subgroups.

Order - Ten soil orders are recognized. They are Entisols, Vertisols, Inceptisols, Aridisols, Mollisols, Spodosols, Alfisols, Ultisols, and Histosols. The properties used to differentiate these soil orders are those that tend to give broad climatic groupings of soils. Two exceptions, the Entisols and Histosols, occur in many different kinds of climate. The two orders recognized in the Coos Bay District are Inceptisols and Ultisols.

Inceptisols are soils with diagnostic horizons that are believed to develop in a short period of time and that do not represent significant eluviation, illuviation, or intense weathering. Blachly, Bohannon, Dement, Digger, Etelka, Preacher, Slickrock, Umpcoos, Whobrey, Jason, Unit 166, Unit 503, Unit 505, Unit 520, Unit 521, Unit 524 and Unit 530 soils are all representative of Inceptisols.

Ultisols are mineral soils that have distinct horizons. The B horizons are enriched by illuviated clay and have low base saturation that decreases with increasing depth. Apt, Edson, Honeygrove and Jory soils represent this order in the Coos Bay District.

TABLE 9. CLASSIFICATION OF THE SOIL SERIES

Soil Series	Family	Subgroup	Suborder	Order
Apt (50)	Clayey, mixed, mesic	Typic Haplohumults	Humults	Ultisols
Blachly (10)	Fine, mixed, mesic	Umbric Dystrochrepts	Ochrepts	Inceptisols
Bohannon (63)	Fine-loamy, mixed, mesic	Typic Haplumbrepts	Umbrepts	Inceptisols
Dement (540)	Fine, mixed, mesic	Umbric Dystrochrepts	Ochrepts	Inceptisols
Digger (66)	Loamy-skeletal, mixed, mesic	Dystric Eutrochrepts	Ochrepts	Inceptisols
Edson (580)	Clayey, mixed, mesic	Typic Haplohumults	Humults	Ultisols
Etelka (557)	Fine, mixed, mesic	Typic Eutrochrepts	Ochrepts	Inceptisols
Honeygrove (14)	Clayey, mixed, mesic	Typic Haplohumults	Humults	Ultisols
Jory (12)	Clayey, mixed, mesic	Xeric Haplohumults	Humults	Ultisols
Preacher (57)	Fine-loamy, mixed, mesic	Typic Haplumbrepts	Umbrepts	Inceptisols
Slickrock (54)	Fine-loamy, mixed, mesic	Pachic Haplumbrepts	Umbrepts	Inceptisols
Umpcoos (564)	Loamy-skeletal, mixed, mesic	Lithic Dystrochrepts	Ochrepts	Inceptisols
Whobrey (501)	Fine-silty over clayey, mixed, mesic	Aquic Eutrochrepts	Ochrepts	Inceptisols
Jason (64)	Loamy-skeletal, mixed, mesic, shallow	Dystric Eutrochrepts	Ochrepts	Inceptisols
Unit 166	Loamy-skeletal, mixed, mesic	Dystric Eutrochrepts	Ochrepts	Inceptisols
Unit 503	Fine-loamy, serpentinitic, mesic	Typic Dystrochrepts	Ochrepts	Inceptisols
Unit 505	Loamy-skeletal over fragmental, mixed, mesic	Dystric Xerochrepts	Ochrepts	Inceptisols
Unit 520	Fine-loamy, mixed, mesic	Dystric Xerochrepts	Ochrepts	Inceptisols
Unit 521	Loamy-skeletal, mixed, mesic	Dystric Xerochrepts	Ochrepts	Inceptisols
Unit 524	Fine-loamy, mixed, mesic	Pachic Haplumbrepts	Umbrepts	Inceptisols
Unit 530	Loamy-skeletal, mixed, mesic	Typic Xerumbrepts	Umbrepts	Inceptisols

Suborder - Each order is subdivided into suborders, primarily on the basis of soil characteristscs that seem to produce classes having the greatest genetic similarity. The suborders have a narrower climatic range than the orders. The criteria for suborders mainly reflect the presence or absence of waterlogging or soil characteristics that result from climatic or vegetational differences.

Ochrepts and Umbrepts are suborders of the Inceptisols. Ochrepts have a relatively light-colored or thin surface horizon that is low in organic matter. Umbrepts have a thick, dark-colored surface horizon that is relatively high in organic matter.

Great Group - The suborders are divided into great groups on the basis of uniformity in the kinds and sequences of major soil horizons and other features. The horizons used as a basis for separating great groups are those in which clay, iron or aluminum, or humus has accumulated. Among the soil features that serve as the criteria for distinguishing between great groups and temperature and moisture content. Major differences in chemical composition, primarily calcium, magnesium, potassium, and sodium, are also used as criteria for great groups. The great group is not listed in table 9 because the name of the great group is the same as the last word in the name of the subgroup.

Dystrochrepts, Eutrochrepts, and Xerochrepts are three great groups of the Ochrepts. Dystrochrepts have a base saturation of less than 60 percent between 10 and 30 inches, and are not dry for as long as 45 consecutive days during the summer season. Eutrochrepts have a base saturation of more than 60 percent in some part of the 10 to 30-inch layer, and are not dry for as long as 45 consecutive days. The Xerochrepts are dry for at least 45 consecutive days during the summer season between depths of 4 and 12 inches.

Subgroup - Each great group is divided into subgroups. One of the subgroups represents the central, or typic, segment of the group. Other subgroups, called intergrades, have properties that are primarily of the great group, but they also have one or more properties of another great group, suborder, or order. The names of subgroups are formed by placing one or more adjectives before the name of the great group. An example is Typic Haplohumult--a "typical" Haplohumult. An Aquic Haplohumult is not typical but has somewhat restricted internal drainage.

Family - Subgroups are divided into families primarily on the basis of properties important to plant growth or soil behavior for engineering. Some soil properties used as family criteria are texture, mineralogy, reaction, soil temperature, thickness of horizons, and consistence. An example is the clayey, mixed, mesic family of Typic Haplohumults.

Series - Soil series consist of a group of soils that are assumed to have formed in a particular kind of parent material and have genetic horizons that are similar in differentiating characteristics and in

arrangement in the profile. Among these characteristics are color, structure, reaction, consistence, and mineralogical and chemical compositions.

Soil series that have been correlated according to standard procedures under the supervision of the United States Department of Agriculture, Soil Conservation Service, are named for a town, county, or other geographic location, where that particular soil was first recognized. Dement, Edson, Etelka, Whobrey and Umpcoos are names of soil series that were first recognized in the Coos Bay District.

Some of the soil series used in this inventory have not yet been officially correlated according to standard procedures and, therefore, have not been named. They are referred to by the numerical symbols that are used on the soil map to identify them. Unnamed soil series first identified in the Coos Bay District are identified with three digit numbers beginning with a 5, such as Unit 503, Unit 505, and Unit 520. An unnamed soil series first identified outside of the Coos Bay District is identified as Unit 166.

E. Descriptions of Soil Series by Subgroups

A discussion of soil series in the Coos Bay District by subgroups is given in this section.

Typic Dystrochrepts - Unit 503 soils are in this subgroup. They are well-drained soils with base saturation of less than 60 percent, dry values of at least 6 within 7 inches of the surface, and no evidence of clay illuviation. These soils are not dry for as long as 45 consecutive days between depths of 4 and 12 inches.

Lithic Dystrochrepts - The Umpcoos soils are in this subgroup. They are similar to Typic Dystrochrepts, except they are underlain by hard bedrock at depths of 10 to 20 inches.

Umbric Dystrochrepts - The Blachly and Dement soils are in this subgroup. These soils have an epipedon that is darker than that of Typic Dystrochrepts but are otherwise like the soils of the typic subgroup. The dry color value is less than 6 in the upper 7 inches of the soil.

Typic Eutrochrepts - The Etelka soils are in this subgroup. They are moderately well-drained soils with base saturation of more than 60 percent in all parts between 10 and 30 inches, dry values of at least 6, moist chromas of at least 4 within 10 inches of the surface, and no evidence of clay illuviation. They are not dry for as long as 45 consecutive days between depths of 4 and 12 inches during the summer season.

Aquic Eutrochrepts - The Whobrey soils are in this subgroup. They are somewhat poorly drained soils with low chroma mottles within 24 inches of the surface. They are otherwise like the Typic Eutrochrepts.

Dystric Eutrochrepts - The Digger, Unit 166 and Jason soils are in this subgroup. These soils are well-drained and are medium or moderately coarse textured. Bedrock occurs at a depth of 20 to 60 inches. The A horizon is thin and dark colored. The B horizon lacks evidence of clay illuviation and has base saturation of at least 60 percent in some subhorizons within 30 inches of the soil surface.

Dystric Xerochrepts - The Unit 505, Unit 520 and Unit 521 soils are in this subgroup. These soils are dry between depths of 4 and 12 inches for at least 45 consecutive days in most years during the summer season, and have a base saturation less than 60 percent throughout the 10 to 30-inch layer. Bedrock is deeper than 20 inches and the surface layer is thin and light-colored. The subsoil lacks evidence of clay illuviation.

Typic Haplumbrepts - The Bohannon and Preacher soils are in this subgroup. These soils are well-drained and overlie sedimentary rocks at a depth greater than 20 inches. The average annual soil temperature is somewhat greater than 47°F. The A horizon is dark in color and is less than 20 inches thick. They have moist chromas of 3 or less and base saturation of less than 50 percent. The B horizon has no significant evidence of clay illuviation. These soils are not dry between depths of 4 and 12 inches for as long as 45 consecutive days during the summer season.

Pachic Haplumbrepts - The Slickrock and Unit 524 soils are in this subgroup. These soils are well-drained. They have a dark-colored solum with chromas of 3 or less to a depth of more than 20 inches and base saturation of less than 50 percent. The B horizon has no significant evidence of clay illuviation. These soils are not dry between depths of 4 and 12 inches for as long as 45 consecutive days during the summer season.

Typic Xerumbrepts - The Unit 530 soils are in this subgroup. These soils are well-drained, deeper than 20 inches, and have a thick, dark-colored surface layer that has a base saturation of less than 50 percent. They are dry between depths of 4 and 12 inches for at least 45 consecutive days in most years during the summer season. The subsoils has no eividence of clay illuviation.

Typic Haplohumults - The Apt, Edson and Honeygrove soils are in this subgroup. They are well-drained clays that have a B horizon where eluviated clay has accumulated. Base saturation is less than 35 percent at a depth of 50 inches below the upper boundary of the illuvial B horizon. The organic matter content in the upper 6 inches of the illuvial B horizon is at least 1.5 percent. The soil is never dry between depths of 4 and 12 inches for as much as 45 consecutive days in more than 6 out of 10 years.

Xeric Haplohumults - The Jory soils are in this subgroup. They differ from the Typic Haplohumults by being dry between depths of 4 and 12 inches for at least 45 consecutive days in most years.

VI. SOIL USE AND MANAGEMENT

A. Engineering Uses of the Soils

This section contains information about the soils of the inventory area significant to engineering uses. The information can be used to (1) make soil and land use studies that will aid in selecting and developing recreational, residential and commercial sites; (2) make preliminary estimates of soil properties that are important in planning ponds, irrigation systems, dikes and waterways; (3) make preliminary evaluations of soil and ground conditions that will aid in selecting locations for roads, pipelines, power transmission lines, and cables, and in planning detailed investigations at the selected sites; (4) locate probable sources of road construction material; (5) correlate performance of engineering structures with soil mapping units to develop information for overall planning that will be useful in planning certain engineering practices; (6) determine the suitability of soils for cross-country movement of vehicles and construction equipment; (7) develop other preliminary estimates for construction purposes pertinent to the particular area.

THIS INFORMATION WILL NOT ELIMINATE THE NEED FOR ON-SITE SAMPLING AND TESTING OF SOILS WHEN THE DESIGN AND CONSTRUCTION OF SPECIFIC ENGINEERING WORKS ARE BEING CONSIDERED. IT SHOULD BE USED PRIMARILY FOR PLANNING DETAILED FIELD INVESTIGATIONS TO DETERMINE THE CONDITION OF THE SOIL MATERIAL AT THE PROPOSED SITE. THE INFORMATION WILL ENABLE SOIL ENGINEERS TO CONCENTRATE ON THE MOST SUITABLE SOILS, TO MAKE FEWER SAMPLES AND TO MAKE AN ADEQUATE INVESTIGATION AT A MINIMUM COST.

Estimated soil properties and soil classifications significant to engineering are given in table 10. These properties and classifications are described in the following paragraphs.

1. Hydrologic Soil Groups

Hydrologic soil groups are used in watershed planning to estimate runoff from rainfall. Soil properties are considered that influence the minimum rate of infiltration obtained for a bare soil after prolonged wetting. These properties are depth of seasonally high water table, intake rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The influence of ground cover on runoff and infiltration is not considered in hydrologic soil groups. Soils are classified into four groups: A, B, C and D.

Group A soils have a low runoff potential. They include soils having high infiltartion rates even when thoroughly wetted and consist chiefly of deep, well-to excessively-drained sands and gravels. There are no group A soils in the inventory area.

Group B soils have a moderately low runoff potential. These are soils having moderate infiltration rates when thoroughly wetted and consisting chiefly of moderately deep, moderately well- and well-drained soils with moderately fine to moderately coarse textures. These soils have a moderate rate of water transmission.

Group C soils have a moderately high runoff potential. These are soils having slow infiltration rates when thoroughly wetted and consisting chiefly of well-drained and moderately well-drained soils with slowly and very slowly permeable layers at moderate depths (20 to 40 inches) and soils with moderately fine to fine textures.

Group D soils have a high runoff potential. These are soils having very slow infiltration rates when thoroughly wetted and consisting chiefly of clay soils with a high swelling potential, soils with a permanent high water table, and soils with a nearly impervious layer at depths of less than 20 inches.

2. Engineering Classification Systems

In addition to the U.S. Department of Agriculture soil textural classification in Table 10, are the Unified Soils Classification System established by the Waterways Experiment Station, Corps of Engineers; and the American Association of State Highway Officials (AASHO) system. The classifications in Table 10 are estimates based on laboratory analysis and field study and comparison with similar soils in other areas.

a. The Unified Soil Classification System

The Unified Soil Classification System is used mainly by the Corps of Engineers and the U.S. Bureau of Reclamation to evaluate soils for roads, airfields, embankments and foundations. The system classifies soils according to their textural and plasticity qualities and their performance as engineering construction materials. The following properties form the basis of soil identification: (1) percentage of gravel, sand and fines (fraction passing the #200 sieve); (2) the shape of the grain size distribution curve; (3) plasticity and compressibility characteristics. The soil is given a letter symbol indicating its principal characteristics, such as ML for loamy or silty soils with a low plasticity index.

On the basis of texture, the soils are divided into (1) coarse-grained, (2) fine-grained and (3) highly organic soils in the unified system. The coarse-grained soils contain 50 percent or less material smaller than the #200 sieve. Highly organic soils are generally identified visually.

Coarse-grained soils are subdivided into gravels (G) and sand (S). The gravels have more than 50 percent of the coarse fraction retained on the #4 sieve and the sands have the greater portion passing the #4 sieve.

The four secondary divisions of each group - GW, GP, GM and GC; or SW, SP, SM and SC - depend on the amount and type of fines and the shape of the grain size distribution curve. The letter W is for well graded; the P is for poorly graded; the M means silty or medium sized; the C means clayey. The grain size curves of well-graded (W) materials are smooth and concave with no sizes lacking and no excess of materials in any size range.

Fine-grained soils are subdivided into silts (M) and clays (C) depending on their liquid limit and plasticity index. Soils for which the plasticity index is less than three-fourths of the liquid limit, minus the constant 15, are M soils. Those for which the plasticity index is greater than three-fourths of the liquid limit, minus 15, are the C soils. If the liquid limit is less than 50 percent, the fine-grained soils are ML or CL. If the liquid limit is greater than 50 percent, they are classified MH or CH. Peat and other highly organic soils are identified as Pt. Organic silts and silty clays of low plasticity are identified as OL and organic clays of medium to high plasticity are identified as OH.

The significance of the various classes of the Unified Soil Classification System to specific engineering uses is summarized in Federal Housing Administration Bulletin No. 373, "Engineering Soil Classification for Residential Developments". In general, the coarse-grained soils, especially when well graded (GW and SW), are most desirable for roadways and foundations and least desirable for reservoirs. They have high bulk densities, are easy to compact, have low compressibility and expansion potential, have low potential frost action, and have a high permeability. The fine-grained soils with high liquid limits (MH and CH) are least desirable for nearly all engineering uses of soils because of their low shearing strengths, high expansion potential, high potential frost action, high corrosion potential, low permeability, and low bulk densities. The most desirable soils for earth embankments to retain water are classified as GW and SC or clayey gravels and clayey snads. Such soils can be compacted relatively easily and, once compacted, have very low permeabilities and are not subject to potential expansion and frost action.

b. The American Association of State Highway Officials System

The American Association of State Highway Officials (AASHO) soil classification system is based on the field performance of soils. In this sytem, classification is based on gradation (particle size distribution), liquid limit and plasticity index of the soil. Grouping soils of about the same general load-carrying capacity and service results in seven basic groups that are designated A-1 through A-7. The best soils for road subgrades are classified as A-1, the next best A-2, etc., with the poorest soils classified as A-7.

Soils groups A-1, A-2 and A-3 are called granular materials and include soils having less than 35 percent of the soil material including gravels and cobbles passing through a #200 sieve. Groups A-4, A-5, A-6 and A-7 are called silt-clay materials and include soils for which more than 35 percent of the material passes through a #200 sieve.

A-1 soils are well-graded mixtures from coarse to fine with a nonplastic or feebly plastic soil binder. A-1-a soils include those materials consisting predominantly of stone fragments or gravel (more than 50 percent is retained on a #10 sieve). A-1-b soils include those materials consisting predominantly of coarse sand (more than 50 percent passes a #10 sieve and more than 50 percent is retained on a #40 sieve). A-1 soils generally are highly stable under wheel loads regardless of moisture conditions. They function satisfactorily as bases for thin bituminous wearing surfaces.

A-2 soils are composed of a wide range of granular materials that are subdivided into subclasses based on differences in liquid limit and plasticity index of the material passing through a #40 sieve. A-2-4 and A-2-5 soils include those granular materials that have soil binder characteristics of a A-4 and A-5 soil groups. The binder material in the A-2-4 soils is predominantly silts that have a relatively low liquid limit (less than 40). The binder material in the A-2-5 soils is very poorly graded and consists mostly of diatoms and mica which are productive of elastic properties and very low stability. A-2-6 and A-2-7 soils include those granular materials that have binder characteristics of the A-6 and A-7 soil groups. The binder material in A-2-6 soils is composed predominantly of clay with a relatively low liquid limit (less than 40) whereas it has a liquid limit of more than 40 in A-2-7 soils. A-2-4 and A-2-5 soils are satisfactory as a road base when propertly drained and compacted. As a base coarse, A-2-6 and A-2-7 soils may lose stability because of capillary saturation or lack of drainage. Generally, A-2 soils are suitable as a blanketing material for very plastic subgrades over which concrete pavement is to be placed.

A-3 soils are composed of sands deficient in soil binder or coarse material. Typical of this group are fine beach sand, fine dune sand and poorly-graded fine sandy alluvium. A-3 soils lack stability under wheel loads except when they are moist. They have no volume change with variations in moisture content and make suitable subgrades for all pavement types when confined. They cannot be compacted with a sheepsfoot roller but may be compacted by vibration or by pneumatic tire or steel wheel rollers.

A-4 soils are very common in occurrence and are composed predominantly of silt. They provide a firm riding surface when dry with little rebounding after loading. When water is absorbed rapidly, these soils expand detrimentally or lose stability and they are subject to frost heave. Bituminous surfaces require substantial base coarses when placed on subgrades of this soil group.

A-5 soils are similar to A-4 soils except that they include very poorly-graded soils containing such materials as diatoms and mica which are productive of elastic properties and very low stability. They are likely to rebound when load is removed when they are dry. A-5 soils are not suitable as subgrades for thin, stabilized, flexible base coarses of bituminous surfaces. They are subject to frost heave.

A-6 soils, of very common occurrence, are composed predominantly of clay with moderate to negligible amounts of coarse material. In the soft or stiff plastic state, they absorb additional water only when manipulated. They have good bearing capacity when compacted to maximum practical density but lose this bearing strength when moisture is absorbed. These soils are compressible, rebound very little when load is removed and are very expansive when compacted at a moisture condition below optimum. These soils possess little internal friction and have low stability at the higher moisture contents. A-6 soils are characterized by shrinkage cracks during dry weather. Gravitational water flow is negligible which makes ordinary drainage installation of little value. These soils are not suitable for use as subgrades under thin flexible base coarses or bituminous surfaces because of the large volume changes that are caused by moisture changes and the loss of bearing strength after the entrance of moisture.

A-7 soils are also composed predominantly of clay but, because of the presence of single-size silt particles, organic matter or lime carbonate, they are elastic. At certain moisture contents they deform quickly under load and rebound appreciably when load is removed. They make particularly undesirable subgrades for flexible pavements. A-7-5 soils represent those A-7 soils with moderate plasticity indexes in relation to liquid limit and may be highly elastic as well as subject to considerable volume change. A-7-6 soils have high plasticity indexes in relation to liquid limit and are subject to extremely high volume change.

3. Coarse Fragments Greater Than Three Inches

"Coarse fragments over three inches in diameter" refers to percent by weight of rock fragments. In the Unified and AASHO systems, these fragments are not considered in the classification. However, it is necessary to know how much fragments are present in evaluating the class.

4. Liquid Limit and Plasticity Index

"Liquid limit" and "plasticity index" indicate the effect of water on the strength and consistency of soil material. As the moisture content of a clayey soil is increased from a dry state, the material changes from a plastic to a liquid state. The plastic limit is the moisture content at which the soil material changes from a semisolid to a plastic state and the liquid limit, from a plastic to a liquid state. The plasticity index is the numerical difference between the liquid

limit and the plastic limit. It indicates the range of moisture content within which a soil material is plastic.

The Liquid limit and plasticity index are obtained either by engineering tests or by estimates of USDA texture and consistence. Assuming 15-bar water is known, liquid limit can be estimated as follows: two times 15-bar water percentage equals liquid limit.

5. Shrink/Swell Potential

Shrink/swell behavior is that quality of the soil that determines its volume change with change in moisture content. The volume change behavior of soils is influenced by the amount of moisture change, and the amount and kind of clay in the soils. Three degrees of limitation are recognized: slight, moderate and severe. Soils rated with a slight degree of limitation have less than 18 percent clay of the mixed or montmorillonitic type, or less than 30 percent clay of the kaolinitic type. Soils classified as having a moderate degree of shrink/swell limitation have 18 to 30 percent clay of the mixed or montmorillonitic type or more than 30 percent clay of the kaolinitic type. Soils having more than 30 percent montmorillonitic or mixed clay are rated as having a severe limitation for shrink/swell.

6. Corrosivity

Corrosivity pertains to potential soil-induced chemical action that dissolves or weakens uncoated steel or concrete. Rate of corrosion of uncoated steel is related to soil properties such as drainage, texture, total acidity, electrical resistivity, and electrical conductivity of the soil material. Corrosivity for concrete is influenced mainly by the content of sodium or magnesium sulfate but also by soil texture and acidity. Installations of uncoated steel that intersect soil boundaries or soil horizons are more susceptible to corrosion than installations entirely in one kind of soil or in one soil horizon. A corrosivity rating of low means that there is a low probability of soil-induced corrosion damage. A rating of high means that there is a high probability of damage, so that protective measures for steel and a more resistant concrete should be used to avoid or minimize damage.

B. Soil Interpretive Ratings for Engineering and Recreational Uses

In this section, suitability of soils for road fill and limitations of soils for road location, water management, community development and recreational uses are discussed. Some recreational uses include camp areas, picnic areas and play areas for organized games like baseball, and footpaths and bridle trails. Soil limitation ratings are given for septic tank absorption fields and other sanitary facilities because of their common association with recreational facilities. The soil interpretations for engineering and recreational uses are listed in table 11 for each slope phase mapped in the District.

TABLE 10. ESTIMATED SOIL PROPERTIES SIGNIFICANT TO ENGINEERING

Soil Property	Soil				
	Mixed Alluvial Land	(10) Blachly		(12) Jory	(14) Honey-Grove
Depth to bedrock (in)	Variable	40+		60+	60+
Depth to seasonal water table (in)	Variable	60+		60+	60+
Hydrologic group	Variable	C		C	C
Depth from surface (in)	Variable	0-9	9-60	0-60	0-60
USDA texture	Variable	clay loam	clay	clay	clay
Unified Soil Classification	Variable	MH	MH	MH	MH
AASHO Classification	Variable	A-5	A-7-5	A-7-5	A-7-5
Percent coarser than 3 in.	Variable	0-5	0-15	0-5	0-5
Percent passing sieve:					
No. 4	Variable	90-100	70-100	95-100	95-100
No. 10	Variable	80-100	70-100	95-100	95-100
No. 40	Variable	70-100	65-100	80-100	80-100
No. 200	Variable	60-75	50-85	60-85	60-85
Liquid limit (%)	Variable	50-65	50-65	55-70	55-70
Plasticity index (%)	Variable	5-10	10-20	10-15	10-15
Max. dry density (lb./cu.ft.)	Variable	75-80	80-85	80-85	80-85
Optimum moisture (%)	Variable	32-36	35-40	30-35	30-35
Shrink-swell potential	Variable	Low	Mod.	Mod.	Mod.
Corrosibility-concrete	Variable	High	High	Mod.	Mod.

TABLE 10. ESTIMATED SOIL PROPERTIES SIGNIFICANT TO ENGINEERING-Continued

Soil Property	Soil					
	(50) Apt	(54) Slickrock		(57) Preacher		
Depth to bedrock (in)	60+	40+		40+		
Depth to seasonal water table (in)	60+	40+		60+		
Hydrologic group	C	B		B		
Depth from surface (in)	0-60	0-7	7-55	0-14	14-42	42-60
USDA texture	clay	gr. loam	gr.clay loam	clay loam	clay loam	loam
Unified Soil Classification	MH	SM	SM	ML	ML	ML or SM
AASHO Classification	A-6 or A-7	A-4	A-5	A-7	A-7	A-4
Percent coarser than 3 in.	0-5	0-15	10-30	0-5	0-5	0-5
Percent passing sieve:						
No. 4	95-100	65-85	75-90	90-100	90-100	80-100
No. 10	80-90	55-75	70-95	80-100	80-100	75-100
No. 40	80-90	40-70	60-75	70-100	70-100	45-85
No. 200	60-70	35-50	40-50	55-80	55-80	20-65
Liquid limit (%)	50-60	30-40	40-50	50-55	50-55	30-40
Plasticity index (%)	10-15	5-10	5-10	10-15	10-15	5-10
Max. dry density (lb./cu.ft.)	80-85	80-85	90-95	80-85	80-85	90-120
Optimum moisture (%)	30-35	30-35	25-30	30-35	30-35	20-25
Shrink-swell potential	High	Low	Low	Mod.	Mod.	Low
Corrosibility-concrete	High	High	High	High	High	High

TABLE 10. ESTIMATED SOIL PROPERTIES SIGNIFICANT TO ENGINEERING-Continued

Soil Property	Soil		
	(63)Bohannon	(64) Jason	(66) Digger
Depth to bedrock (in)	20-40	10-20	20-40
Depth to seasonal water table (in)	40+	40+	40+
Hydrologic group	C	D	B
Depth from surface (in)	0-24	0-20	0-30
USDA texture	gr. loam	gr. loam	gr. loam
Unified Soil Classification	SM	GM	SM or GM
AASHO Classification	A-4	A-2	A-2 or A-4
Percent coarser than 3 in.	0-15	15-35	15-30
Percent passing sieve:			
No. 4	90-100	40-60	50-80
No. 10	80-90	25-50	50-75
No. 40	70-85	25-45	45-75
No. 200	40-50	15-35	20-45
Liquid limit (%)	35-50	20-40	35-40
Plasticity index (%)	5-10	5-10	5-10
Max. dry density (lb./cu.ft.)	75-80	90-120	90-100
Optimum moisture (%)	35-40	20-25	20-25
Shrink-swell potential	Low	Low	Low
Corrosibility-concrete	High	Low	Low

TABLE 10. ESTIMATED SOIL PROPERTIES SIGNIFICANT TO ENGINEERING-Continued

Soil Property	Soil					
	(166) Unit 166		(501) Whobrey		(503) Unit 503	
Depth to bedrock (in)	40+		60+		40+	
Depth to seasonal water table (in)	40+		18		60+	
Hydrologic group	B		D		C	
Depth from surface (in)	0-6	6-44	0-20	20-60	0-6	6-50
USDA texture	gr. loam	v. gr. loam	silt loam	clay	sicl	sicl
Unified Soil Classification	SM or GM	GM	ML	CH	ML or MH	CH or MH
AASHO Classification	A-2 or A-4	A-2	A-4	A-7-6	A-6	A-7
Percent coarser than 3 in.	15-30	15-60	2-10	0-5	0-10	5-30
Percent passing sieve: No. 4	50-80	40-60	95-100	95-100	75-90	70-90
No. 10	50-75	25-50	90-100	95-100	70-90	70-90
No. 40	45-75	25-45	85-95	95-100	65-85	65-85
No. 200	25-45	15-35	60-75	90-95	50-80	50-80
Liquid limit (%)	35-40	20-40	30-40	55-70	55-65	55-65
Plasticity index (%)	5-10	5-10	5-10	35-45	30-40	30-40
Max. dry density (lb./cu.ft.)	90-100	90-120	90-110	85-115	80-100	80-100
Optimum moisture (%)	20-25	20-25	30-40	30-35	30-40	30-40
Shrink-swell potential	Low	Low	Low	High	Mod.	High
Corrosibility-concrete	Low	Mod	High	High	Mod.	Mod.

TABLE 10. ESTIMATED SOIL PROPERTIES SIGNIFICANT TO ENGINEERING-Continued

Soil Property	Soil					
	(505) Unit 505		(520) Unit 520		(521) Unit 521	
Depth to bedrock (in)	20-40		40+		20-40	
Depth to seasonal water table (in)	60+		60+		60+	
Hydrologic group	B		C		D	
Depth from surface (in)	0-7	7-29	0-11	11-40	0-6	6-29
USDA texture	gr. si.l.	V.gr. sicl.	gr. loam	gr. sicl.	v.gr. loam	gr. sicl.
Unified Soil Classification	ML	GM	GM or ML	ML or MH	GM	ML or CL
AASHO Classification	A-4	A-2	A-2 or A-4	A-4 or A-6	A-2 or A-4	A-2 or A-4
Percent coarser than 3 in.	0-10	25-35	0-10	20-35	10-30	0-10
Percent passing sieve:						
No. 4	80-100	35-65	75-100	70-90	55-75	70-100
No. 10	80-90	30-50	70-90	65-80	50-65	70-95
No. 40	70-80	20-45	65-85	60-75	45-55	60-80
No. 200	55-70	15-40	35-50	45-60	35-50	40-50
Liquid Limit (%)	40-50	30-50	35-45	40-50	40-50	30-50
Plasticity index (%)	5-10	10-15	5-10	10-15	5-10	5-10
Max. dry density (lb./cu. ft.)	80-100	100-130	85-100	80-95	100-130	80-100
Optimum moisture (%)	25-35	30-40	20-30	25-35	25-35	30-40
Shrink-swell potential	Low	Low	Low	Mod.	Low	Mod.
Corrosibility-concrete	Mod.	Mod.	Mod.	High	Mod.	High

TABLE 10. ESTIMATED SOIL PROPERTIES SIGNIFICANT TO ENGINEERING—Continued

Soil Property	Soil					
	(524) Unit 524		(530) Unit 530		(540) Dement	
Depth to bedrock (in)	40-60		20-40		40+	
Depth to seasonal water table (in)	60+		60+		60+	
Hydrologic group	B		B		C	
Depth from surface (in)	0-10	10-48	0-11	11-33	0-12	12-44
USDA texture	v.gr.loam	gr. sicl	gr.loam	v.gr.loam	si.loam	sicl
Unified Soil Classification	GM	ML or CL	ML	GM	ML	ML
AASHO Classification	A-2 or A-4	A-4	A-2	A-2	A-4	A-7
Percent coarser than 3 in.	0-5	0-5	0-10	10-30	0-5	0-10
Percent passing sieve:						
No. 4	20-55	55-80	70-90	50-65	95-100	90-100
No. 10	15-50	50-75	60-85	45-60	95-100	90-100
No. 40	10-35	40-60	40-55	40-50	90-100	85-100
No. 200	5-20	25-45	35-50	35-45	70-90	90-90
Liquid limit (%)	20-30	30-50	45-50	20-25	25-30	40-50
Plasticity index (%)	5-10	5-10	5-10	5-10	2-8	15-20
Max. dry density (lb./cu.ft.)	100-130	80-100	80-95	90-120	90-100	80-90
Optimum moisture (%)	25-35	25-35	20-30	20-25	20-30	30-35
Shrink-swell potential	Low	Mod.	Low	Low	Low	Mod.
Corrosibility-concrete	Mod.	Mod.	Mod.	Mod.	Low	Mod.

TABLE 10. ESTIMATED SOIL PROPERTIES SIGNIFICANT TO ENGINEERING-Continued

Soil Property	Soil				
	(557) Etelka		(564) Umpcoos	(580) Edson	
Depth to bedrock (in)	40+		10-20	40+	
Depth to seasonal water table (in)	30		40+	60+	
Hydrologic group	D		D	C	
Depth from surface (in)	0-13	13-50	0-16	0-6	6-46
USDA texture	si. loam	silty c.	v.gr. s.l.	clay l.	silty c.
Unified Soil Classification	ML	ML or CL	GM	ML	ML or CL
AASHO Classification	A-4	A-6 or A-7	A-2	A-4	A-6 or A-7
Percent coarser than 3 in.	0-5	0-5	5-20	0-5	0-5
Percent passing sieve:					
No. 4	95-100	90-100	40-65	95-100	95-100
No. 10	90-100	85-100	45-60	95-100	95-100
No. 40	85-100	80-100	40-50	90-100	95-100
No. 200	65-90	75-95	35-45	70-80	85-95
Liquid limit (%)	25-40	45-70	20-25	35-40	35-45
Plasticity index (%)	5-10	15-30	NP	10-15	15-20
Max. dry density (lb./cu.ft.)	90-130	80-105	90-120	85-130	85-130
Optimum moisture (%)	20-35	30-40	20-25	20-35	30-40
Shrink-swell potential	Low	High	Low	Mod.	Mod.
Corrosibility-concrete	High	High	Low	Mod.	Mod.

Rating terms used for soil suitability are good, fair and poor. Rating terms used for soil limitations are slight, moderate and severe.

1. Road Fill

Road fill is soil material used for making embankments for roads. Low embankments or upper parts of high embankments serve as subgrade (foundation) for the road. Thus, soil material good for road fill is also good for subgrade.

Ratings, good, fair and poor, reflect how well a soil performs after it is removed from its orginal location and placed in a road embankment. They also reflect evaluation of soil characteristics, such as slope, that determine ease in getting soil out. Generally, the rating is given for the whole soil, from the surface to a depth of 5 to 6 feet, based on the assumption that soil horizons will be mixed in loading, dumping and spreading.

2. Road Location

The limitation ratings given in this column apply to use of soils for construction and maintenance of access roads that have all-weather surfacing -- rock or oil and rock -- that are expected to carry truck traffic all year.

Excluded from consideration in the ratings in this column are highways designed for fast moving heavy trucks. Also, the ratings cannot substitute for basic soil data and for on-site investigation. Degrees of soil limitation are slight, moderate and severe.

3. Pond Locations and Embankments

Pond reservoir areas hold water behind a dam or embankment. Features affecting this use are permeability, depth to bedrock, and slope gradient. Soil properties affecting the seepage rate are of primary concern.

Embankments are earthfills designed to hold back water. Features affecting these uses are shear strength, compressibility, permeability of the compacted soil, susceptibility to piping, compaction characteristics, shrink/swell potential, and stoniness. Ratings given apply only to small, homogenous embankments.

4. Shallow Excavations

Shallow excavations are those that require digging or trenching to a depth of less than 6 feet. Important features affecting excavations are a seasonally high water table, flooding, slope, soil texture, depth to bedrock or other cemented layer, stoniness, and rockiness.

5. Building Sites

Single family dwellings of one or two stories with public or community sewage disposal facilities. The soil and any geologic materials are evaluated to a depth of 5 feet. Ratings are based on the soils in their natural state. Degrees of soil limitations are slight, moderate and severe.

6. Camp Areas

A camp area is an area that is used intensively for tents, campers and small camp trailers and for outdoor living. Camping areas require little site preparation other than minor shaping and leveling of areas used for tents and parking. The soils must be able to support heavy foot traffic and limited vehicular traffic.

Soil suitability for growing and maintaining vegetation is not a part of this guide but is an item to consider in final evaluation of a site. Not considered in the ratings were the problems of water supply, sewage disposal or access roads.

A soil has slight limitations for campsites if all of the following features apply: Slopes are less than 8 percent; drainage is excessive, somewhat excessive or well; depth to the seasonal water table is more than 30 inches; there is no flooding; permeability is rapid to moderately rapid, inclusive; surface soil texture is sandy loam, silt loam or loam; soil depth is 20 inches or more; gravel covers less than 20 percent of the surface area; stones cover less than 0.1 percent of the area; rock outcrops cover less than 2 percent of the area.

A soil that has a moderate limitation for campsites has one or more of the following features: Slopes are 8 to 15 percent; drainage is somewhat poor; depth to the seasonal water table is 20 to 30 inches; flooding does not occur during season of use; permeability is moderately slow or slow; the surface soil texture is clay loam, sandy clay loam, silty clay loam or loamy sand; soil depth to rock is between 10 and 20 inches; gravel covers between 20 and 50 percent of the surface area; stones cover between 0.1 and 3 percent of the surface area; rock outcrops cover from 2 to 25 percent of the area.

A soil has severe limitations for campsites if one or more of the following features apply: Slopes are more than 15 percent; depth to seasonal water table is less than 20 inches; flooding occurs during season of use; permeability is very slow; the surface texture is silty clay, sandy clay, clay or loose sand; depth to rock is less than 10 inches; gravel covers over 59 percent of the surface area; stones cover more than 3.0 percent of the surface area; rock outcrops cover more than 25 percent of the surface area.

7. Picnic Areas

A picnic area is a place that is intensively used for daytime outdoor food preparation and eating. Picnic areas require little site preparation other than minor shaping and leveling of areas for picnic tables. The soils must be able to support heavy traffic by people.

Soil suitability for growing vegetation is not a part of this guide but is an item to consider in final evaluation of a site. Problems of water supply and sewage disposal are not considered in the rating. Most vehicular traffic will be confined to access roads.

A soil has slight limitations for picnic areas if all of the following features apply: Slopes are less than 8 percent; the drainage class is moderately well, well or somewhat excessive; seasonal water tables are deeper than 20 inches; flooding does not occur during season of use; surface soil texture is sandy loam, fine sandy loam, silt loam or loam; gravel covers less than 20 percent of the surface area; stones and rocks cover less than 3 percent of the surface area.

A soil that has moderate limitations for use as a picnic area has one or more of the following features; Slopes are 8 to 15 percent; the drainage class is somewhat poor and the depth to a seasonal water table may be less than 20 inches for short periods during the season of use; flooding occurs 1 or 2 times for short periods during the season of use; surface Surface soil textures are sandy clay loam, clay loam, sandy clay, silty clay loam, or loamy sand; gravel covers from 20 to 50 percent of the area; stones and rocks cover from 3 to 15 percent of the surface area.

A soil has severe limitations for picnic areas if one or more of the following features apply: Slopes are more than 15 percent; the drainage class is poorly drained and the water table is above 20 inches for a month or more during the season of use; flooding occurs more than twice during the season of use; the surface soil texture is sandy clay, silty clay, clay, or loose sand; gravel covers more than 50 percent of the surface area; stones and rocks cover 15 percent of the surface area.

8. Play Areas

A playground is an area intensively used for organized games such as baseball, football, badminton, volleyball and the like. They are commonly associated with day-use parks and schools. The soils must be able to support heavy traffic by people. A nearly-level surface, good drainage, and a soil texture and consistence that gives a firm surface are generally needed. Rock outcrops and coarse fragments are undesirable. Soil suitability for growing vegetation is not a part of this guide, but it is an important item to consider in final evaluation of a site.

A soil has slight limitations for playgrounds if all of the following features apply: Slopes are less than 2 percent; drainage is somewhat excessive, well, or moderately well and the depth to a seasonal water table is greater than 30 inches during the season of use; there is no flooding; permeability is rapid or moderate; surface soil texture is sandy loam, fine sandy loam, silt loam or loam; the soil is nongravelly; stones cover less than 0.01 percent of the surface area; rock outcrops cover less than 2 percent of the surface area; depth to bedrock is more than 40 inches.

A soil that has moderate limitations for playgrounds has one or more of the following features: Slopes range from 2 to 6 percent; drainage is somewhat poor and the depth to a seasonal water table during the season of use is between 20 and 30 inches; floods occur once in 2 or more years during the season of use; surface soil texture is sandy clay loam, clay loam, silty clay loam, or loamy sand; depth to bedrock is 20 to 40 inches; gravel covers less than 20 percent of the surface area; stones cover between 0.01 and 3.0 percent of the surface area; rock outcrops cover from 2 to 10 percent of the area; permeability is moderately slow or slow.

A soil has severe limitations for playgrounds if one or more of the following features apply: Slopes are more than 6 percent; drainage is poor and the depth to a seasonal water table during the season of use is less than 20 inches; flooding occurs more frequently than once in 2 years; permeability is very slow; surface soil texture is sandy clay, clay, silty clay, or sand; depth to bedrock is less than 20 inches; gravel covers more than 20 percent of the surface area; stones cover more than 3 percent of the surface area; rock outcrops cover more than 10 percent of the surface area.

9. Paths and Trails

Paths and trails are areas that are used for local and cross-country hiking and/or horseback riding. The chief requirement for such areas is good trafficability. The areas are assumed to be for use as they occur in nature and little soil will be moved.

The path and trail ratings are based on soil properties and qualities only. They do not take into account other features, such as esthetic value, that would make the path site desirable but would require more preparation and maintenance. An example is a mountain lookout where a guardrail would be needed.

A soil has slight limitations for paths and trails if all of the following features apply: Slopes are 0 to 15 percent; drainage is somewhat excessive, well, or moderately well, and the depth to a seasonal water table is more than 20 inches; floods occur no more than once a year during the season of use; surface textures are sandy loam, fine sandy loam, loam, or silt loam; gravel covers less than 20 percent of the surface area; stones cover less than 0.01 percent of the area; rock outcrops cover less than 10 percent of the area.

A soil that has moderate limitations for paths and trails has one or more of the following features: Slopes range from 15 to 25 percent; drainage is somewhat poor; floods occur 2 or 3 times during each season of use; surface soil texture is silty clay loam, sandy clay loam, clay loam, or loamy sand; gravel covers from 20 to 50 percent of the surface area; stones cover from 0.01 to 3.0 percent of the area; rock outcrops cover from 10 to 25 percent of the area.

A soil has severe limitations for paths and trails if one or more of the following features apply: Slopes are more than 25 percent, drainage is poor or very poor; floods occur more than 3 times during each season of use; surface soil textures are sandy clay, silty clay, clay, or sand; gravel covers more than 50 percent of the surface area; stones cover more than 3.0 percent of the surface area; rock outcrops cover more than 25 percent of the area.

10. Septic Tank Absorption Fields

The term "septic tank absorption fields" refers to a sewage disposal system in which waste is distributed to a central tank and the effluent from the tank is dispersed over a fairly large area of filter field lines buried in the soil. Sites developed for camping, picnicking and playgrounds ordinarily require some form of an independent sewage disposal system. These ratings also apply to any disposal fields, such as waste water, in addition to sewage disposal systems.

The soil limitation ratings for this use are based on soil properties and qualities only. Coarse-textured soils, for example, may permit contamination of water supplies. Water, required for the system, may not be readily available at the site.

A soil has slight limitations for absorption fields if all of the following features apply: Permeability is more than 1.0 inch per hour, or the percolation rate is faster than 45 minutes per inch of drop in water level; depth to seasonal water table is more than 6 feet; drainage is somewhat excessive or well; depth to impervious bedrock or permanent water is more than 6 feet; slope is between 0 and 7 percent; flooding never occurs.

A soil that has a moderate limitation for septic tank absorption fields has one or more of the following features: Permeability is between 1.0 and 0.63 inches per hour, or the percolation rate is between 45 and 75 minutes per inch; depth to a seasonal water table is between 4 and 6 feet; drainage class is moderately well or somewhat poor; depth to impervious bedrock or permanent water table is between 4 and 6 feet; slopes range from 7 to 12 percent floods occur less than once in 10 years; the duration of overflow during flooding is 48 hours or less.

A soil has severe limitations for this use if one or more of the following apply: Permeability is less than 0.63 inches per hour, or the percolation rate is lower than 75 minutes per inch of drop in water level; depth to seasonal water table is less than 4 feet; drainage is less than somewhat poor; depth to impervious bedrock or permanent water table is less than 4 feet; slope is more than 15 percent; floods occur one or more times in a 10-year period; the duration of any overflow is more than 48 hours.

Installation of subsurface sewage disposal systems must meet county ordinances and are subject to approval by the County Health Officer.

11. Sewage Lagoons

A sewage lagoon (aerobic) is a shallow lake used to hold sewage for the time required for bacterial decomposition. The requirements for this embankment are the same as for other embankments designed to impound water (see embankments, Table 10). Soil requirements for basin floors of lagoons are slow rate of seepage, even surface of low gradient and low relief, and little or no organic matter.

C. Soil Properties and Qualities Significant to Plant Growth and Timber Production

This section provides information about the soils that are significant to such things as soil moisture retention, internal soil moisture movement, erosion, soil productivity and frost action. These soil properties and qualities are listed in table 12 by soil series.

1. Drainage Class

Soil drainage, as a quality of the soil, refers to the frequency and duration of periods when the soil is free of saturation or partial saturation. Soil drainage classes are determined by observations and inferences used to evaluate the depth to the water table. These classes are based on those morphological characteristics that are affected by aeration within the soil profile.

Very Poorly Drained - Water table remains at or near the surface a greater part of the time. Field evidences of very poor drainage are level or depressed areas, presence of water table above 18 inches, a peaty or mucky surface horizon, or colors as follows:

Immediately below any dark surface horizon at least 7 inches thick (dry values of 5.5 or less and moist values of 3.5 or less) as follows: (1) if hues are 10YR in the Munsell Soil Color Chart or redder and are accompanied by mottling, chromas are /2 or less on ped faces or in the matrix and if hues of 10YR or redder are not mottled, chromas are less than /1; (2) if hues are between 10YR and 10Y and are accompanied by distinct or prominent mottles, chromas are /3 or less on ped faces or in the matrix, and if hues between 10YR and 10Y are not mottled, chromas

TABLE 11. SOIL INTERPRETATIONS FOR ENGINEERING AND RECREATIONAL USES

Soil Symbol	Soil Name	Degree of Limitation and Soil Features Affecting - Suitability for Roadfill	Road Location	Ponds: Location	Ponds: Embankment	Shallow Excavations	Building Sites	Camp Areas	Picnic Areas	Play Areas	Paths and Trails	Septic Tank Absorption field	Lagoon Sewage Disposal
1-V	Mixed Alluvial land 0-10% Slopes	V	S, F	V	V	S, F	S, F	M, F	M, F	M, F	Slight	S, F	S, F
10-V	Blachly silty clay loam 0-10% Slopes	Poor LS A-7	S, LS, Slope	S, Slope	S, compressible, hard to pack, LS	S, too clayey Slope	S, LS Slope	M slope percs slowly	M Slope	S, Slope	Slight Slope	S, Percs slowly	S, Slope
10-W	Blachly silty clay loam 10-35% Slopes	Poor, LS A-7	S, LS, Slope	S, Slope	S, compressible, hard to pack	S, too clayey	S, LS	M to S Slope	M to S Slope	S, Slope	Slight to M Slope	S, Percs slowly, Slope	S, Slope
10-X	Blachly silty clay loam 35-60% slopes	Poor, LS A-7	S, LS Slope	S, Slope	S, compressible, hard to pack	S, too clayey Slope	S, LS Slope	S, Slope	S, Slope	S, Slope	S, Slope	S, Percs slowly, Slope	S, Slope
10-Y	Blachly silty clay loam 60-80% Slopes	Poor, LS A-7	S, LS Slope	S, Slope	S, compressible, hard to pack	S, too clayey, Slope	S, LS Slope	S, Slope	S, Slope	S, Slope	S, Slope	S, Percs slowly, Slope	S, Slope
12-W	Jory silty clay loam 10-35% Slopes	S, LS A-7	S, LS	M to S, Slope	M to S, Slope, hard to pack	M to S, too clayey, Slope	M to S, LS	S, Slope	M to S, too clayey, Slope	S, Slope	M to S, too clayey, Slope	S, Percs slowly, Slope	S, Slope
12-X	Jory silty clay loam 35-60% Slopes	S, LS, A-7	S, LS Slope	S, Slope	S, Slope	S, Slope	S, Slope	S, Slope	S, Slope	S, Slope	M to S, too clayey, Slope	S, percs slowly, Slope	S, Slope
14-W	Honeygrove silty clay loam, A-7	Poor, LS, Slope,	S, LS Slope	Slight to M, Slope	S, LS	M to S, too clayey, Slope	S, LS	M to S, too clayey, Slope	M to S, too clayey, Slope	S, too clayey, Slope	M to S, too clayey, Slope	S, percs slowly, Slope	S, Slope

Key: F - Floods M - Moderate
V - Variable S - Severe
LS - Low strength

TABLE 11 SOIL INTERPRETATIONS FOR ENGINEERING AND RECREATIONAL USES - Continued

Soil Symbol	Soil Name	Suitability for Roadfill	Road Location	Degree of Limitation and Soil Features Affecting - Ponds		Shallow Excavations	Building Sites	Camp Areas	Picnic Areas	Play Areas	Paths and Trails	Septic Tank Absorption field	Lagoon Sewage Disposal
				Location	Embankment								
14-X	Honeygrove silty clay loam 35-60% Slopes	Poor, LS, Slope, A-7	S, LS, Slope	M to S, Slope	S, LS	S, Slope	S, LS,	S, Slope	S, Slope	S, Slope	M to S, Slope	S, Percs slowly, Slope	S, Slope
50-Y	Apt clay loam 60-80% Slopes	Poor, thin layer, Slope, Shrink-swell, A-7	S, Slope	S, Slope	S, LS	S, too clayey, Slope	S, Shrink-swell, Slope	S, Slope	S, Slope	S, Slope	S, Slope	S, Slope	S, percs slowly, Slope
54-W	Slickrock, gravelly-clay loam 10-35% Slopes	Fair to poor, Slope, A-5	M, Slope	M to S, Slope, M perm., Bedrock	M to S, Low compressibility, M perm., piping	M to S, texture, Slope	M to S, Slope	M to S, Slope surface texture	M to S, slope, surface texture	S, Slope	Slight to M, Slope, surface texture	M to S, medium perm. depth to bedrock	M to S, Slope, depth to bedrock
54-X	Slickrock, Gravelly-clay loam 35-60% Slopes	Poor, Slope, A-6	S, Slope	S, Slope	S, Slope	S, Slope	S, Slope	S, Slope	S, Slope	S, Slope	S, Slope	S, Slope	S, Slope
57-V	Preacher clay loam 0-10% Slopes	Fair, LS, Slope, A-7	M, Slope	M, Slope	M, Slope	M, Slope	M, Slope	M, Slope	M, Slope	S, cobbles & pebbles, Slope	M, Slope	M, Slope	S, pebbles & cobbles
57-W	Preacher clay loam 10-35% Slopes	Fair, LS, Slope A-7	S, Slope	S, Slope	M, Slope	S, Slope	S, Slope	S, Slope	S, Slope	S, cobbles & pebbles Slope	M, Slope	S, Slope	S, pebbles & cobbles
57-X	Preacher clay loam 35-60% Slopes	Poor, Slope, A-7	S, Slope	S, Slope	S, Slope	S, Slope	S, Slope	S, Slope	S, Slope	S, cobbles & pebbles, Slope	S, Slope	S, Slope	S, Slope

Key: M - Moderate S - Severe
LS - Low strength

TABLE 11 , SOIL INTERPRETATIONS FOR ENGINEERING AND RECREATIONAL USES-Continued

Soil Symbol	Soil Name	Suitability for Roadfill	Road Location	Degree of Limitation and Soil Features Affecting - Ponds: Location	Ponds: Embankment	Shallow Excavations	Building Sites	Camp Areas	Picnic Areas	Play Areas	Paths and Trails	Septic Tank Absorption field	Lagoon Sewage Disposal
57-Y	Preacher clay loam 60-80% Slopes	Poor, Slope, A-7	S, Slope	S, Slope	S, Slope	S, Slope	S, Slope	S, Slope	S, Slope	S, cobbles & pebbles, Slope	S, Slope	S, Slope	S, Slope
63-W	Bohannon gravelly clay loam, 10-35% slopes	Fair-poor, A-4 or A-2, borrow area damage, slope	M to S, depth to rock, slope	S, R perc, depth to rock, slope	M, compressible, piping	S, depth to rock, Slope	M - S, slope, depth to rock	M - S, slope, cobbles, pebles	M, Slope	S, Slope	M, Slope	S, depth to rock, slope	S, Slope
63-X	Bohannon gravelly clay loam, 35-60% slopes	Poor, A-4 or A-2, slope	S, Slope	S, R perc, depth to rock, slope	M, compressible, piping	S, depth to rock, slope	S, Slope	S, Slope	S, Slope	S, Slope	S, Slope	S, depth to rock, slope	S, Slope
63-Y	Bohannon gravelly clay loam, 60-80% slopes	Poor, A-4 or A-2, slope	S, Slope	S, R perc, depth to rock, slope	M, compressible, piping	S, depth to rock, slope	S, Slope	S, Slope	S, Slope	S, Slope	S, Slope	S, depth to rock, Slope	S, Slope
63-Z	Bohannon gravelly clay loam, 80-120% slopes	Poor, A-4 or A-2, Slope	S, Slope	S, R perc, depth to rock, slope	M, compressible, piping	S, depth to rock, slope	S, Slope	S, Slope	S, Slope	S, Slope	S, Slope	S, depth to rock, slope	S, Slope
64-W	Unit 64 gravelly loam 10-35% slopes	Poor, A-1 or A-2, borrow area damage, slope	S, depth to rock, slope	S, R perc, depth to rock, slope	M, hard to pack, piping	S, depth to rock, slope	M - S, depth to rock slope	M - S, slope, pebbles	M, slope	M, slope, depth to rock	M, slope, depth to rock	S, depth to rock slope	S, slope
64-X	Unit 64 gravelly loam 35-60% slopes	Poor, A-1 or A-2, slope,	S, slope	S, R perc, depth to rock, slope	M, hard to pack, piping	S, depth to rock, slope	S, depth to rock, slope	S, slope	S, slope	S, slope	S, slope	S, depth to rock, slope	S, slope

Key: S - Severe M - Moderate
R perc - Rapid percolation

TABLE 11 SOIL INTERPRETATIONS FOR ENGINEERING AND RECREATIONAL USES - Continued

Soil Symbol	Soil Name	Degree of Limitation and Soil Features Affecting - Suitability for Roadfill	Road Location	Ponds: Location	Ponds: Embankment	Shallow Excavations	Building Sites	Camp Areas	Picnic Areas	Play Areas	Paths and Trails	Septic Tank Absorption field	Lagoon Sewage Disposal
64-Y	Unit 64 gravelly loam 60-70% slopes	Poor, A-1 or A-2, slope	S, Slope	S, R Perc, depth to rock, slope	M, hard to pack, piping		S, depth to rock,	S, slope	S, slope	S, slope	S, slope	S, depth to rock, slope	S, slope
64-Z	Unit 64 gravelly loam 80-120% slopes	Poor, A-1 or A-2, slope	S, Slope	S, R perc, depth to rock, slope	M, hard to pack, piping	S, depth to rock, slope	S, depth to rock, slope	S, slope	S, slope	S, slope	S, slope	S, depth to rock, slope	S, slope
66-W	Digger gravelly loam 10-35% slopes	Fair-poor, A-1 or A-2, slope	M - S, depth to bedrock, slope	S, R perc, depth to bedrock, slope	M, hard to pack, piping	S, depth to rock, slope	M - S, slope, depth to bed-rock	M - S, slope, cobbles pebbles	M, slope	M, slope	M, slope	S, depth to rock, slope	S, slope
66-X	Digger gravelly loam 35-60% slopes	Poor, A-1 or A-2, slope	S, slope	S, R perm, depth to bedrock, slope	M, hard to pack, piping	S, depth to rock, slope	S, slope	S, slope	S, slope	S, slope	S, slope	S, depth to rock, slope	S, slope
66-Y	Digger gravelly loam 60-80% slopes	Poor, A-1 or A-2, slope	S, slope	S, R perm, depth to bedrock, slope	M, hard to pack, piping	S, depth to rock, slope	S, slope	S, slope	S, slope	S, slope	S, slope	S, depth to rock, slope	S, slope
66-Z	Digger gravelly loam 80-120% slopes	Poor, A-1 or A-2, slope	S, slope	S, R perm, depth to bedrock, slope	M, hard to pack, piping	S, depth to rock, slope	S, slope	S, slope	S, slope	S, slope	S, slope	S, depth to rock, slope	S, slope
166-Y	Unit 166 gravelly loam 60-80% slopes	Poor, A-1 or A-2 slope	S, slope	S, R perm, slope	M, hard to pack, piping	S, slope	S, slope	S, slope	S, slope	S, slope	S, slope	S, slope	S, slope
501-W	Whobrey silt loam 10-35% slopes	Fair, LS high shrink-swell, slope A-7	S, LS, high shrink-swell, Slope	S, slope	S, LS, com-pressible	S, slope	S, slope wet	S, slope wet	S, slope	S, slope	M, slope	S, slow perc, slope	S, slope

Key: S - Severe M - Moderate
LS - Low strength
R perc - Rapid percolation
R perm - Rapid permeability

TABLE 11 SOIL INTERPRETATIONS FOR ENGINEERING AND RECREATIONAL USES-Continued

Soil Symbol	Soil Name	Suitability for Roadfill	Degree of Limitation and Soil Features Affecting - Road Location	Ponds: Location	Ponds: Embankment	Shallow Excavations	Building Sites	Camp Areas	Picnic Areas	Play Areas	Paths and Trails	Septic Tank Absorption field	Lagoon Sewage Disposal
501-X	Whobrey silt loam 35-60% slopes	Poor, slope, A-7	S, slope	S, slope	S, LS, compressible	S, slope	S, slope	S, slope	S, slope	S, slope	S, slope	S, slow perc, slope	S, slope
501-Y	Whobrey silt loam, 60-80% slopes	Poor, slope, A-7	S, slope	S, slope	S, LS, compressible	S, slope	S, slope	S, slope	S, slope	S, slope	S, slope	S, slow perc	S, slope
503-W	Unit 503 silty clay loam, 10-35% slopes	Fair, LS, A-5	M, slope	M - S, slope, perm	M - S, low compressibility, piping	M, slope, cobbles	M - S slope	S, slope	S, slope	S, slope	M, slope	S, slope	S, slope
503-X	Unit 503 silty clay loam, 35-60% slopes	Poor, slope, A-5	S, slope	S, slope	S, slope	S, slope	S, slope	S, slope	S, slope	S, slope	S, slope	S, slope	S, slope
505-W	Unit 505 gravelly silt loam, 10-35% slopes	Fair-poor, A-1 or A-2, slope	M - S, depth to bedrock, slope	S, R perm depth to bedrock, slope	M, hard to pack, piping	S, depth to rock, S	M - S, slope, depth bedrock	M - S, slope, pebbles	M, slope	S, slope	M, slope	S, depth to rock, slope	S, slope
505-X	Unit 505 gravelly silt loam, 35-60% slopes	poor, A-1 or A-2, slope	S, slope	S, R perm, depth to bedrock, slope	M, hard to pack, piping	S, depth to rock, S	S, slope	S, slope	S, slope	S, slope	S, slope	S, depth to rock, slope	S, slope
520-W	Unit 520 gravelly loam, 10-35% slopes	Fair, LS slope, A-4	S, slope	S, slope	M, slope	M - S, slope	M - S, slope	M - S, slope	M, slope	S, slope	M, slope	M - S, slope	S, slope

Key: S - Severe M - Moderate
LS - Low strength
R perm - Rapid permeability

TABLE 11 SOIL INTERPRETATIONS FOR ENGINEERING AND RECREATIONAL USES-Continued

Soil Symbol	Soil Name	Suitability for Roadfill	Road Location	Ponds		Shallow Excavations	Building Sites	Camp Areas	Picnic Areas	Play Areas	Paths and Trails	Septic Tank Absorption field	Lagoon Sewage Disposal
				Location	Embankment								
			Degree of Limitation and Soil Features Affecting -										
520-X	Unit 520 gravelly loam, 35-60% slopes	Poor, slope, A-4	S, slope	S, slope	S, slope	S, slope	S, slope	S, slope	S, slope	S, slope	S, slope	S, slope	S, slope
520-Y	Unit 520 gravelly loam, 60-8-% slopes	Poor, slope, A-4	S, slope	S, slope	S, slope	S, slope	S, slope	S, slope	S, slope	S, slope	S, slope	S, slope	S, slope
521-W	Unit 521 very gravelly loam, 10-35% slopes	Fair-poor A-1 or A-2, slope	M - S, depth to bedrock, slope	S, R perc, depth to bedrock, slope	M, hard to pack, piping	S, depth to rock, slope	M - S, slope, depth, to bedrock	M - S, slope, pebbles	M, slope	S, slope	M, slope	S, depth to rock, slope	S, slope
521-X	Unit 521 very gravelly loam 35-60% slopes	Poor, A-1 or A-2, slope	S, slope	S, slope	M, hard to pack, piping	S, slope, depth to rock	S, slope	S, slope	S, slope	S, slope	S, slope	S, depth to rock, slope	S, slope
521-Y	Unit 521 very gravelly loam, 60-80% slopes	Poor, A-1 or A-2 slope	S, slope	S, slope	M, hard to pack, piping	S, slope, depth to rock	S, slope	S, slope	S, slope	S, slope	S, slope	S, depth to rock, slope	S, slope
524-W	Unit 524 gravelly loam, 10-35% slopes	Fair-poor, A-5 slope	M, slope	M - S, slope, M perm. of bedrock	M - S, hard to pack, piping, Med. perm.	M - S, slope	M - S, slope	M - S, slope	M - S, slope	S, slope	M, slope	M - S, slope	M - S, slope
524-X	Unit 524 gravelly loam, 35-60% slopes	Poor, A-5, slope	S, slope	S, slope	S, slope	S, slope	S, slope	S, slope	S, slope	S, slope	S, slope	S, slope	S, slope

Key: S - Severe M - Moderate
LS - Low strength
R perc. - Rapid percolation
Med. perm. - Medium permeability

TABLE 11 SOIL INTERPRETATIONS FOR ENGINEERING AND RECREATIONAL USES -Continued

Soil Symbol	Soil Name	Degree of Limitation and Soil Features Affecting - Suitability for Roadfill	Road Location	Ponds		Shallow Excavations	Building Sites	Camp Areas	Picnic Areas	Play Areas	Paths and Trails	Septic Tank Absorption field	Lagoon Sewage Disposal
				Location	Embankment								
530-W	Unit 530 gravelly loam, 10-35% slopes	Fair-poor, A-1 or A-2, slope	M - S, depth to bedrock, slope	S, R perc, depth to bedrock, slope	M, hard to pack, piping	S, depth to bedrock slope	M - S, slope, depth to bedrock	M - S, slope, pebbles cobbles	M, slope	S, slope	M, slope	S, depth to bedrock, slope	S, slope
530-X	Unit 530 gravelly loam 35-60% slopes	Poor, A-1 or A-2, slope	S, slope	S, R perc, depth to bedrock, slope	M, hard to pack, piping	S, depth to bedrock, slope	S, slope	S, slope	S, slope	S, slope	S, slope	S, depth to bedrock, slope	S, slope
540-W	Dement silt loam, 10-35% slopes	Poor, A-7	S, LS, slope	S, slope	M, hard to pack, piping	S, too clayey, slope	S, slope, M shrink-swell	S, slope, slow perm	S, slope	S, slope	M, slope	S, slope slow perc	S, slope
540-X	Dement silt loam, 35-60% slopes	Poor, A-7, slope	S, slope	S, slope	S, slope	S, slope	S, slope	S, slope	S, slope	S, slope	S, slope	S, slope	S, slope
557-W	Etelka silt loam, 10-35% slopes	Fair. LS high shrink-swell, A-6 or A-7	S, slope	S, slope	S, LS, compressible	S, slope	S, slope	S, slope wet	S, slope wet	S, slope	M, slope	S, slow perc,	S, slope
557-X	Etelka silt loam, 35-60% slopes	Poor, slope, A-6 or A-7	S, slope	S, slope	S, LS, compressible	S, slope	S, slope	S, slope	S, slope	S, slope	S, slope	S, slow perc, slope	S, slope
557-Y	Etelka silt loam, 60-80% slopes	Poor, slope, A-6 or A-7	S, slope	S, slope	S, LS, compressible	S, slope	S, slope	S, slope	S, slope	S, slope	S, slope	S, slope, slow perc	S, slope

Key: S - Severe M - Moderate
LS - Low Strength
R perc - Rapid percolation

TABLE 11 SOIL INTERPRETATIONS FOR ENGINEERING AND RECREATIONAL USES-Continued

Soil Symbol	Soil Name	Suitability for Roadfill	Road Location	Degree of Limitation and Soil Features Affecting - Ponds		Shallow Excavations	Building Sites	Camp Areas	Picnic Areas	Play Areas	Paths and Trails	Septic Tank Absorption field	Lagoon Sewage Disposal
				Location	Embankment								
564-Y	Umpcoos-very gravelly snady loam 60-80% slopes	Poor, slope A-1 or A-2	S, slope	S, slope	M, hard to pack, piping	S, slope, depth to rock	S, slope, depth to rock	S, slope	S, slope	S, slope	S, slope	S, slope, depth to rock	S, slope
564-Z	Umpcoos-very gravelly sandy loam, 80+% slopes	Poor, slope, A-1 or A-2	S, slope	S, slope	M, hard to pack, piping	S, slope, depth to rock	S, slope, depth to rock	S, slope	S, slope	S, slope	S, slope	S, slope, depth	S, slope
580-W	Edson-silty clay loam, 10-35% slopes	Poor, A-7, slope	S, slope	S, slope	S, hard to pack, LS	S, too clayey, slope	S, LS, slope	S, slope	S, slope	S, slope	M, slope	S, slow perc, slope	S, slope
580-X	Edson-silty clay loam, 35-60% slopes	Poor, A-7, slope	S, slope	S, slope	S, slope	S, slope too clayey	S, slope	S, slope	S, slope	S, slope	S, slope	S, slope	S, slope
R-X	Rockland 35-60% slopes	Poor, slope, thin layer (not ratable AASHO)	S, slope, depth to rock	S, slope, depth to rock	S, hard to pack, piping	S, slope, depth to rock	S, slope, depth to rock	S, slope, large stones	S, slope, large stones	S, slope, large stones	S, slope, large stones	S, slope, depth to rock	S, slope, depth to rock
R-Y	Rockland 60-80% slopes	Poor, slope, thin layer (not ratable AASHO)	S, slope, depth to rock	S, slope, depth to rock	S, hard to pack, piping	S, slope, depth to rock	S, slope, depth to rock	S, slope, large stones	S, slope, large stones	S, slope, large stones	S, slope, large stones	S, slope, depth to rock	S, slope depth to rock
R-Z	Rockland 80+% slopes	Poor, slope, thin layer (not ratable AASHO)	S, slope, depth to rock	S, slope, depth to rock	S, hard to pack, piping	S, slope, depth to rock	S, slope, depth to rock	S, slope, large stones	S, slope, large stones	S, slope, large stones	S, slope, large stones	S, slope, depth to	S, depth to rock

Key: S - Severe M - Moderate
LS - Low strength

are /1 or less; (3) hues bluer than 10Y; (4) any color, if due to uncoated grains of sand; OR

If surface 7-inches are not dark, then mottles, iron-manganese concretions or chromas of /2 or less must occur within 7 inches of soil surface; and if a textural B horizon is present, it has: (1) dominant chromas of /1 or /2 in hues of 10YR or redder on ped faces or in the matrix if peds are lacking, accompanied by mottles of stronger chroma; (2) dominant chromas of /1 to /3 in hues of 2.5Y or yellower on the ped faces or in the matrix if peds are lacking, accompanied by mottles of stronger chroma and redder hue; (3) dominant chromas of /1 or less on ped faces or in the matrix if no peds are present with or without mottles of stronger chroma.

Soils that are very poorly drained due to a moving water table may have oxidized rather than reduced colors because of dissolved oxygen in water. Drainage is a minimum prerequisite for the growth of important crops. Usually, grazing is possible, at least seasonally, and hay may be harvested in drier years. Commercial timber production of conifer species is not possible.

Poorly Drained - Soil remains wet much of the time with the water table near the surface for prolonged intervals. Field evidences are the presence of a high water table (at depths of 18 to 36 inches), colors as above, for the very poorly drained soils, but below 7 inches and above 20 inches. Soils usually lack peaty or mucky surface horizons. Drainage is necessary for growth of important plants. Grazing is possible most of the time and hay can usually be harvested. Commercial timber production of conifer species is poor to fair.

Somewhat Poorly Drained - Soil is wet for significant periods, usually because of a slowly permeable layer or a high water table. Field evidences are the presence of a water table (at depths of 36 to 60 inches), colors as above but within 20 to 36 inches of the surface, unusually thick and dark A horizons (related to abundant growth of coarser grasses and slower decomposition rates because of wetness), pronounced accumulations of water-soluble salts within 36 inches, or a combination of these. Artificial drainage is needed for growth of most deep-rooted plants and many others that are sensitive to poor aeration. Drainage may also be necessary to maintain a favorable salt balance. Commercial timber production of conifer species is fair to good where climatically adapted.

Moderately Well Drained - Profile is wet for a small but significant part of the time, usually because of a slowly permeable layer within or immediately beneath the solum, a relatively high or intermittently high water table (usually below 5 feet), surface additions of water by runoff from areas higher up the slopes or a combination of these conditions. Moderately well drained is particularly difficult to assess in drier climates and where winter rainfall occurs when temperatures are low

TABLE 12 SOIL PROPERTIES AND QUALITIES SIGNIFICANT TO PLANT GROWTH AND TIMBER PRODUCTION

SYMBOL	SOIL	DRAINAGE CLASS	PERMEABILITY	RUNOFF	SOIL DEPTH (in.)	AVAILABLE WATER HOLDING CAPACITY (in.)	WATER SUPPLYING CAPACITY (in.)	REACTION RANGE (pH)	EROSION SUSCEPT-IBILITY	COMPACTION HAZARD	MEAN ANNUAL PRECIPITA-TION (in.)	FROST FREE SEASON
1	Alluvial Land	Variable	Variable	Variable	Var.	Var.	Var.	Variable	Variable	Variable	60-120	160-250
10	Blachly	Well	Moderately slow	Medium	60+	9-11	19-25	4.5-5.0	Moderate	Severe	80-120	150-190
12	Jory	Well	Moderately slow	Slow	60+	9-11	19-25	4.5-6.0	Moderate	Severe	40-60	160-220
14	Honeygrove	Well	Moderately slow	Medium-rapid	40-60	7-11	17-25	5.1-6.1	Moderate	Severe	60-90	160-220
50	Apt	Well	Moderately slow	Medium-rapid	60+	7-11	17-25	4.5-5.5	Moderate-Severe	Severe	60-90	160-220
54	Slickrock	Well	Moderate	Medium-rapid	40-60+	8-10	18-24	4.5-4.0	Moderate-Severe	Moderate	60-120	160-220
57	Preacher	Well	Moderate	Slow-rapid	40-60+	8-10	18-24	4.5-5.0	Moderate-Severe	Moderate	80-120	150-190
63	Bohannon	Well	Moderate	Medium-rapid	20-40	2.5-6	13-21	4.5-6.0	Moderate-Severe	Moderate	60-120	150-190
64	Jason	Somewhat excessive	Moderately rapid	Medium-rapid	10-20	1-2	11-17	5.5-6.0	Moderate-Severe	Slight	60-100	150-190
66	Digger	Well	Moderately rapid	Medium-rapid	20-40	2-4	12-19	5.5-6.0	Slight-Severe	Slight	60-100	150-190
166	Unit 166	Well	Moderately rapid	Medium-rapid	40-60+	4-6	14-21	5.5-6.0	Moderate-Severe	Slight	60-100	150-190
501	Whobrey	Somewhat poor	Very slow	Medium-rapid	40-60+	8-10	18-25	5.6-8.0	Moderate-Severe	Severe	60-100	160-220

TABLE 12 SOIL PROPERTIES AND QUALITIES SIGNIFICANT TO PLANT GROWTH AND TIMBER PRODUCTION - Continued

SYMBOL	SOIL	DRAINAGE CLASS	PERMEABILITY	RUNOFF	SOIL DEPTH (in.)	AVAILABLE WATER HOLDING CAPACITY (in.)	WATER SUPPLYING CAPACITY (in.)	REACTION RANGE (pH)	EROSION SUSCEPT-IBILITY	COMPACTION HAZARD	MEAN ANNUAL PRECIPITA-TION (in.)	FROST FREE SEASON
503	Unit 503	Well	Moderate	Slow-Rapid	40-60	8-10	18-25	5.0-5.5	Moderate-Severe	Moderate	60-120	150-200
505	Unit 505	Well	Moderate-rapid	Slow-Rapid	20-40	2-4	14-21	5.0-5.5	Moderate-Severe	Slight	60-120	190-250
520	Unit 520	Well	Moderately rapid	Slow-Rapid	40-60	4-8	14-23	5.0-5.5	Moderate-Severe	Moderate	60-120	150-200
521	Unit 521	Well	Moderately rapid	Medium-Rapid	20-40	2-4	12-18	5.0-5.5	Moderate-Severe	Slight	60-120	150-200
524	Unit 524	Well	Moderate	Medium-Rapid	40-60	8-10	20-27	4.5-5.0	Moderate-Severe	Moderate	60-120	190-250
530	Unit 530	Well	Moderately rapid	Medium-Rapid	20-40	2-4	14-21	5.0-5.5	Moderate-Severe	Slight	60-120	190-250
540	Dement	Well	Moderately slow	Slow-Rapid	40-60	8-10	20-27	5.0-6.5	Slight-Severe	Severe	60-100	190-250
557	Etelka	Moderately well	Slow	Medium-Rapid	60+	10-12	20-25	5.1-5.5	Slight-Severe	Moderate	60-100	160-220
564	Umpcoos	Somewhat excessive	Moderately rapid	Medium-Rapid	10-20	1-2	11-17	5.5-6.0	Severe	Slight	60-100	150-190
580	Edson	Well	Moderately slow	Medium-Rapid	40-60	8-10	20-27	5.0-5.5	Slight-Severe	Severe	70-100	190-250
R	Rockland	Variable	Variable	Rapid	0-10	0-1	0-18	Variable	Variable	Slight	60-120	150-250

enough to almost inhibit growth. Evidence includes somewhat thicker and darker A horizons as contrasted to those of well-drained soils, indistinct mottling in the lower B horizons or within 36 inches of the surface or both. Artificial drainage may be needed for some deep-rooted plants and some others that are particularly sensitive to short periods of poor aeration. Commercial timber production is very good for climatically-adapted species.

Well Drained - Water is removed readily but not rapidly. Soils are commonly intermediate in texture but in dry climates may even be fine textured. Chromas are generally more than /2 below the surface horizon unless the parent materials have an inherently low chroma. Soils are free of mottling, at least within the usual depth of plant roots. Under natural conditions of drainage, soil aeration is not a problem associated with well-drained soils. Commercial timber production is good for climatically adapted species.

Somewhat Excessively Drained - Water is removed from thse soils rapidly. Soils may be very shallow or shallow, many have little horizon differentiation and are sandy and very porous. Soils are similar in color to well-drained soils. Soils are droughty and produce a narrow range of plants, except in humid climates, with a uniform distribution of rainfall or unless irrigated.

Excessively Drained - Water is removed from these soils very rapidly. Soils are commonly composed of sands and gravels and are very porous. Soils are similar in color to well-drained soils. Dark A horizons are occasionally present. Most of these soils are unsuitable for ordinary plant production.

2. Permeability

Permeability is that quality of a soil that enables it to transmit water or air. Accepted as a measure of this quality is the rate at which soil transmits water while saturated. Permeability is estimated on the basis of soil characteristics observed in the field, particularly structure and texture. The estimates do not take into account lateral seepage or such transient soil features as plowpans and surface crusts.

The following classes and rates are used:

Permeability Class	Numerical Range (inches per hour)
Very slow	Less than 0.06
Slow	0.06 - 0.2
Moderately slow	0.2 - 0.6
Moderate	0.6 - 2.0
Moderately rapid	2.0 - 6.0
Rapid	6.0 - 20.0
Very rapid	More than 20.0

3. Runoff

Runoff, sometimes called surface runoff or external soil drainage, refers to relative rate water is removed by flow over the soil surface. It includes water falling as rain as well as water flowing onto the soil. Where needed for clear descriptions, six classes are recognized by the characteristics of the soil profile, soil slope, climate, and cover. Sometines the term runoff is applied to whole watersheds to refer to all the water entering stream flow, including that from springs.

Ponded (POND) - No water escapes as runoff. Total amount of water that must be removed from ponded areas by movement through the soil or by evaporation is usually greater than the total rainfall. Ponding normally occurs in depressed areas and may fluctuate seasonally.

Very Slow (VSLOW) - Surface water flows away so very slowly that free water lies on the surface for long periods or enters immediately into the soil. Much of the water either passes through the soil or is evaporated. Soils with very slow surface runoff are commonly level or very open and porous.

Slow (SLOW) - Surface water flows away so slowly that free water covers the soil for significant periods or enters soil rapidly. A large part of the water passes through the profile or evaporates. Soils with a slow rate of surface runoff are either nearly level, gently sloping, or absorb precipitation very rapidly. Normally, there is little or no erosion hazard.

Medium (MED) - Surface water flows away at such a rate that a moderate proportion of water enters soil profile and free water lies on surface for only short periods. A large part of precipitation is absorbed by soil, evaporates, or moves downward into underground channels. With medium runoff, loss of water over surface does not reduce seriosly the supply available for plant growth. Erosion hazard may be slight to moderate if soils are cultivated.

Rapid (RAP) - A large proportion of precipitation moved rapidly over the soil surface and a small part moved through soil profile. Surface water runs off nearly as fast as it is added. Soils with rapid runoff are usually moderately steep to steep and have low infiltration capacities. Erosion hazard is commonly moderate to high.

4. Available Water Holding Capacity

"Available water holding capacity" refers to the total qualtity of water available for plant growth that is stored in the effective root zone, or for very deep soils in the upper 60 inches of the soil profile at field capacity. It includes the potential water capacity in the

root zone between the limits of permanent wilting point and field capacity. It is largely dependent upon effective soil depth, texture and coarse-fragment content. Soil structure and organic-matter content have a minor influence on the available water capacity. In general, profiles that contain 50 percent coarse fragments (by volume), will only have one-half the moisture capacity of a comparable soil that if free of coarse fragments. Average available water capacities for nongravelly textural classes expressed as inches of water per inch of soil are: 0.06 for sand; 0.08 for loamy sand; 0.10 for sandy loam; 0.16 for loam; 0.18 for clay loam; 0.20 for silt loam and silty clay loam; and 0.18 for silty clay and clay. The classes of available water capacity for the entire effective root zone are:

Descriptive Term	Available Water (in inches)
Very high	More than 12
High	9 to 12
Moderate	6 to 9
Low	3 to 6
Very low	0 to 3

5. Water-Supplying Capacity

"Water-supplying capacity" pertains to the moisture, not exceeding evapotransporation, which fall during the growing season, in inches, plus the inches of moisture available in the soil profile at the beginning of plant growth. The growing season begins when the dominant plants show evidence of growth. Plant growth may begin in the spring, or in the fall for cool-season plants, depending on available moisture. Water-supplying capacity is also referred to as effective precipitation.

6. Reaction Range

Reaction is the degree of acidity or alkalinity of a soil expressed in pH values. Reaction range shows highest and lowest pH in the total soil profile without reference to any particular layer or depth.

Reaction Description	pH Range
Extremely acid	Below 4.5
Very strongly acid	4.5 - 5.0
Strongly acid	5.1 - 5.5
Medium acid	5.6 - 6.0
Slightly acid	6.1 - 6.5
Neutral	6.6 - 7.3
Mildy alkaline	7.4 - 7.8
Moderately alkaline	7.9 - 8.4
Strongly alkaline	8.5 - 9.0
Very strongly alkaline	Above 9.0

7. Erosion Susceptibility

This quality is the susceptibility of a soil to erosion when no cover is present. Rate of soil displacement is influenced primarily by soil qualities, physical properties, rainfall intensity, and slope gradient. Consider each of six items listed within each of the three classes when classifying the area. Classes and rating items are as follows:

Class	
Slight	- Potential erosion is not significant to reduce productivity; - They contain water stable aggregates; - They have good infiltration and percolation rates; - They have adequate depth to store most of the normal precipitation; - They contain no restrictive layers; - They occur on gentle slopes.
Moderate	- Potential erosion is significant to reduce productivity but not to the point of entirely restricting production; - They contain aggregates that are not water stable; - They have moderate infiltration and percolation rates; - They have moderate depths to store only part of the normal precipitation (AWC); - They occur on moderate slopes.
Severe	- Potential erosion will cause a reduction in productivity to practically zero; - They contain very unstable aggregates; - They have slow infiltration and percolation rates; - They have little soil for water storage; - They contain restrictive layers; - They occur on steep slopes.

8. Compaction Hazard

Compaction results from pressing soil particles together into a close state of contact. The amount of compaction which can be obtained principally is influenced by the soil's physical properties, moisture content, type and amount of compaction effort. Soils are rated as having a slight, moderate, or severe susceptibility to a compactive force that reduces its productivity by restricting root development and internal air and water movement. Slight means soils properties generally are favorable for use under most conditions. Moderate means soil properties are unfavorable and, under some conditions, use should be restricted. Severe means soil properties are so unfavorable that use at any time could create soil conditions very difficult to correct.

D. Forest Management

Table 13 lists items that will assist managers of forest lands in planning timber harvest and reforestation programs.

1. Productivity - Site Index and Class

Soil productivity is measured by site index and site class of the major managed species. Site indexes are measured for various conifer species and identified with the soil in which they are growing. Available moisture is critical during the growing season. In most cases, the productivity of a soil differs according to aspect, elevations, variations in soil depth, coarse-fragment content, and thickness and kind of A horizon.

2. Regeneration Hazard

Regeneration hazard is given for bare-root stock with no distinction made for age or species. Regeneration hazard is defined as the probable success of establishing new plantings as influenced by soil or topographic conditions. Three classes are recognized. The ratings are based on the percent of plantations that are expected to regenerate on the first attempt. A slight hazard means success on more than 80 percent of the plantations. A moderate hazard means success on 30 to 80 percent of the plantations. A severe hazard means success on less than 30 percent of the plantations.

Reduction of soil productivity, siltation to streams and high road maintenance costs are hazards involved with timber harvest. These hazards can be minimized and other resource values protected by applying the logging method best suited to the soils and terrain.

Table 14 is a guide to reduce the impact from surface disturbance during timber harvest on forested watersheds.

Erosion hazard and slope stability are discussed in Section V, Soils, under Descriptions of Soil Series and Mapping Units and Section IV-C under Landforms and Topography. Compaction hazard is listed in table 12, Soil Properties and Qualities Significant to Plant Growth and Timber Production.

Soils with a shallow rooting depth, either because of a high water table or a shallow depth to bedrock, have a severe windthrow hazard. Soils with a significant windthrow hazard are identified in the remarks column of Table 13. Figure 33 illustrates the effects of a windthrow hazard on soils of the Whobrey (501) and Etelka (557) series, which have a relatively high water table during much of the growing season.

Figure 33 Severe windthrow on a Douglas fir stand due to coastal winds of hurricane velocity on soils of the Etelka (557) and Whobrey (501) series from the Otter Point Formation.

TABLE 13 FOREST MANAGEMENT INTERPRETATIONS

MAP SYMBOL	SOIL	SPECIES	PRODUCTIVITY SITE CLASS AND (INDEX)	REGENERATION HAZARD	BURNING HAZARD	REMARKS
1	Alluvial Land	Douglas fir	Variable	Slight	Slight	Buffer strips included.
10	Blachly	Douglas fir	II (170)	Slight	Slight	Severe compaction hazard. Cutbanks >15 ft. in depth are unstable.
12	Jory	Douglas fir	III (135)[3]	Slight (N) Moderate (S)	Slight	Severe compaction hazard.
14	Honeygrove	Douglas fir	III+ or II[2]	Slight	Slight	Severe compaction hazard.
50	Apt	Douglas fir	II[2]	Slight	Slight	Severe landslide and compaction hazard. Severe brush competition
54	Slickrock	Douglas fir	III+ (160)	Slight	Slight	Severe brush competition on slopes < 25%; Severe piping hazard
57	Preacher	Douglas fir	II[2]	Slight	Slight	Cutbanks > 15 ft. in depth are usually unstable.
63	Bohannon	Douglas fir	III[2]	Slight	Slight	
64	Jason	Douglas fir	IV (110)[3]	Moderate (N) Severe (S)	Severe	Severe erosion and landslide hazard. Severe windthrow hazard.
66	Digger	Douglas fir	II[1]	Slight (N) Moderate (S)	Slight (N) Severe (S)	Grass encroachment on south slopes may be a problem. Severe piping hazard.
166	Unnamed	Douglas fir	III (Estimated)	Slight (N) Moderate (S)	Slight to Severe	Avoid slash burning on south slopes
501	Whobrey	Douglas fir	III+ (157)	Slight	Slight	Severe windthrow, landslide and compaction hazard (See figure 33).
503	Unnamed	Douglas fir	V (Estimated)	Severe	Severe	Low Site (Non-Forest)

TABLE 13 FOREST MANAGEMENT INTERPRETATIONS - Continued

MAP SYMBOL	SOIL	SPECIES	PRODUCTIVITY SITE INDEX AND CLASS	REGENERATION HAZARD	BURNING HAZARD	REMARKS
505	Unnamed	Douglas fir	IV+ (110)	Moderate (N) Severe (S)	Slight (N) Severe (S)	Severe landslide hazard when road cuts at cutbank > 15 ft.
520	Unnamed	Douglas fir	IV- (100)	Severe	Severe	Low Site (Non-Forest)
521	Unnamed	Douglas fir	V- (Estimated)	Severe	Severe	Low Site (Non-Forest)
524	Unnamed	Douglas fir	III (142)	Slight to Moderate	Slight	Severe piping hazard. High Site for merchantable tan oak.
530	Unnamed	Douglas fir	IV+ (115)	Moderate (N) Severe (S)	Slight	Severe brush competition.
540	Dement	Douglas fir	III- (136)	Slight	Slight	Severe compaction hazard.
557	Etelka	Douglas fir	II- (165)	Slight	Slight	Severe landslide hazard. Moderate to severe windthrow hazard (See figure
564	Umpcoos	Douglas fir	IV- (90)	Severe	Severe	Severe erosion and landslide hazard Severe windthrow hazard.
580	Edson	Douglas fir	III- (130)	Slight (N)	Slight (N)	Severe compaction hazard. Cutbanks > 15 ft. in depth are unstable.

1/ Eugene, Oregon BLM District

2/ Alsea Area, Oregon Soil Survey Report (Corliss 1973)

3/ Reconnaissance Soil Survey of Willamette Basin, Oregon Segment III: Uplands Outside National Forests (Thomas 1969)

Table 14. Guidelines for Selection of Yarding Methods and Equipment

Yarding Method	Slope Restrictions	Soils Restrictions
Cable or Tractor	35% slope gradient	All with slight or moderate compaction hazard.
Cable (One-end Suspension)	35 to 60% gradient	All with moderate or severe compaction, erosion & landslide hazards
Skyline Cable (Full Suspension)	60 to 80% gradient	All with severe erosion and landslide hazards
Aerial Skyline Cable (Full Suspension)	80% gradient	All extremely unstable terrain (Umpcoos, Jason, Digger, Rock land, Unit 166)

3. Burning Hazard

The burning hazard (broadcast burning) refers to the threat that wildfires or slash burning has to increase the runoff and erosion hazards, and to reduce the success of regeneration. Field observations have shown that broadcast burning on slopes steeper than 80 percent promotes conditions favorable for a severe erosion hazard by dry ravelling. Actual measurements of ravel material in the H. J. Andrews Experimental Forest, Blue River, Oregon showed a ravelling loss as great as 1,050 tons per square kilometer (approximately 1500 tons/sq.mi., or 2.3 tons/acre) between the ninth and fourteenth month following the burn. The ravel losses represent only an estimated 40 percent of the total erosion losses. Ravelling becomes insignificant two years after a burn if vegetation becomes re-established.

It has been observed that a hot burn temporarily increases the runoff and erosion on the Jason (64), Digger (66), Unit 166, Unit 521, Unit 530 and Umpcoos (564) soils because of the development of a water-repellent or non-wettable condition brought about by burning. This condition tends to disappear about a year after the burn.

The soils have been rated into two classes of broadcast burning hazard in Table 13. These classes are defined as follows:

Slight Hazard: Broadcast burning of slash will not significantly increase the erosion and ravelling hazard, and will not reduce the regeneration and productivity potential of these soils. The soils are mostly moderately deep to deep, nonskeletal and occur on slopes less steep than 80 percent.

Severe Hazard: Broadcast burning of slash will significantly increase surface runoff, erosion, and ravelling hazard, and will reduce the regeneration and productive potential for these soils. They are mostly shallow and moderately deep, skeletal soils on slopes steeper than 80 percent.

E. Wildlife

The variety and number of wildlife species that live in a particular area are determined by the suitability of the environment as habitat. Suitable wildlife habitat provides an adequate supply of food, water and cover which is related to the soils, land use, climate, vegetation and topography. Soils and management of the land are most important because their interaction limits both the quality and quantity of the habitat. (Crawford, 1975; Denney, 1974). Proper forest land use planning should determine the potential for land to produce under different systems of management. Sustained use of the soils in the inventory area for wildlife depends upon a well-planned management program. Knowledge of the soils can serve as a basis for the development and maintenance of wildlife habitat. Properly located timber access roads and carefully selected timber harvest plans should help protect wildlife habitat.

Game and non-game wildlife species in the area are important for (1) the recreational opportunities they provide, (2) the beneficial control of rodents and insects, and (3) the impact on the local economy.

The inventory area hosts many types of wildlife. Big-game animals, upland gamebirds, small game, non-game animals, fur-bearers, water fowl and fish are present in considerable variety.

Black-tailed deer, Roosevelt elk and black bear are the chief big-game animals in the area. They prefer to feed in recently cutover timberland and seek cover in timber reserves.

Upland game birds include band-tailed pigeons, mourning doves, blue and ruffed grouse, and quail.

Brush rabbits and Western gray squirrels are the common small game.

Mice, moles, chipmunks, ground squirrels, and mountain beaver are some of the non-game small animals found in the area.

Many fur-bearing animals frequent the area. These include otter, marten, mink, beaver, skunk, raccoon, ring-tailed cat and weasel.

Cougar (also classified as big game), coyote and bobcat are the most important predatory animals.

Most of the waterfowl habitat is located on private or State lands outside of the area.

There is a varied and abundant supply of fish in the watersheds of the area. Game fish include chinook and coho salmon, steelhead, white sturgeon, cutthroat trout, shad, striped bass, and rainbow trout. Crayfish are prevalent in all of the major streams, especially Smith River.

Forest management practices cause surface soil disturbances that may contribute sediment to the stream bedload which has a detrimental effect on aquatic habitat. Response of the soils in the inventory area to management techniques and erosion-control measures differs considerably. However, degree, place and time of disturbance have greater impacts upon water quality than on the soil.

Raptors of the area include the bald eagle, osprey, spotted owl and the red-tailed hawk. The bald eagle is on the endangered list and the spotted owl is considered rare by the State of Oregon Department of Fish and Wildlife.

A population of feral hogs exists in the Curry County portion of the area. Acorns of the tan oak and chinquapin trees provide a major portion of their diet. These animals are domesticated hogs gone wild after abandonment by homesteaders, miners and other pioneer settlers.

The habitat of the area provides ample food, water and escape cover for deer and elk. Wildlife forage is provided by the numerous clearings that are created by the clearcut harvest method of logging Douglas fir. Some damage to Douglas fir plantation seedlings may occur in the clearcut areas due to overgrazing by both deer and elk. Table 15 illustrates a few important relationships between wildlife management and the soils of the Coos Bay District.

TABLE 15 WILDLIFE MANAGEMENT AND SOILS

Watershed or Area	Forest Practices and Wildlife Conflict	Soil Name	Wildlife	Key Species Vegetative Potential		Remarks
				Herbaceous	Woody	
Wassen Ridge Steampot Ridge Curry County	Critical Summer Range	Slickrock (54) Jason (64) Digger (66) Blachly (10) Dement (540) Preacher (57) Unit 505, Unit 530	Black Bear Black Tailed Deer	Sword Fern Bear grass	Salmonberry W. Thimbleberry Red huckleberry Evergreen Huckleberry Manzanita	Opening the forest canopy may encourage harassment and illegal harvest by increasing road density and reducing the available protective cover from predators and man.
District	Douglas fir Plantation Damage	Preacher (57) Bohannon (63) Slickrock (54) Blachly (10)	Mountain Beaver Porcupine	Bracken Fern	Salal Douglas fir, Hemlock W. Red Cedar	"High site" soils usually provide most favorable habitat for mountain beaver; churning of soil is beneficial.
District	Beaver Dams	All Soils	Beaver		R. Alder, Big leaf Maple	Contributes additional debris and sediment to mass movements upstream.
North Fork Coquille River North Fork Soup Creek, Cox Creek	Douglas fir Plantation Damage Removal of protective cover	Bohannon (63) Preacher (57) Slickrock (54) Jory (12), Blachly (10) Unit 505, Edson (580) Dement (540)	Black-tailed Deer Roosevelt Elk	Sword Fern	Evergreen, Huckleberry Vine Maple	Southerly aspects in clearcuts are preferred winter range because of temperature and sunshine. Timber reserve provides cover on both northerly and southerly aspects.
Alder Creek North Fork Coquille River Brummit Creek North Fork Soup Creek	Critical calving benches and wallows	Apt (50) Preacher (57) Blachly (10) Honeygrove (14) Slickrock (54) Mixed Alluvial land (1)	Roosevelt Elk	Sword Fern Maiden Hair Fern Lady Fern	Elderberry, W. Thimbleberry, Myrtle, Evergreen, Huckleberry Red Huckleberry	Old growth Douglas fir on gentle slopes provide excellent cover and terrain for elk wallows and elk calving benches. Elk feed on grass and browse in clearcuts. These are most stable locations for roads and landings. Elk trample newly seeded road cutbanks and rehabilitated landings which contributes to slope failures.

TABLE 15 WILDLIFE MANAGEMENT AND SOILS (Continued)

Watershed or Area	Forest Practices and Wildlife Conflict	Soil Name	Wildlife	Key Species Vegetative Potential		Remarks
				Herbaceous	Woody	
District	Snag trees	All soils of area	Raptors Woodpeckers			Trees supply perching and nesting habitat for birds. Supplies food for woodpeckers; classed as firehazards during fire season.
North Fork Chetco River Rogue River	Stand conversion	Unit 524 Unit 530 Dement (540)	Feral Hogs	Beargrass	Tan Oak Chinquapin Manzanita Canyon Live Oak and Alder	Vegetative source of food consists mainly of vegetation to be removed and replaced, thru stand conversion.
All streams less than 3 to 5% gradient	Critical spawning beds	Etelka (557) Whobrey (501)	Salmonids			Etelka and Whobrey soils are sources of sediment contribution to stream bed load.

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APPENDIX I - Laboratory Data

This appendix presents laboratory data for a few selected soils in the inventory area. Table 16 summarizes the physical properties and Table 17 gives the chemical properties of these soils. Data in the tables are useful to soil scientists in classifying soils and in forming concepts of soil genesis. They also are helpful in estimating the water capacity, erosion susceptibility and fertility of soils that suggest soil management techniques and practices for multiple-use planning.

TABLE 16 SOIL PHYSICAL PROPERTIES

SOIL NAME, SAMPLE NUMBER, AND LOCATION	DEPTH FROM SURFACE (in.)	HORIZON	PARTICLE SIZE DISTRIBUTION IN MILLIMETERS (Percentage)								TEXTURAL CLASS	MOISTURE HELD AT (Percentage)		
			SAND						SILT (0.05-0.002)	CLAY (0.002)		1/10 BAR	1/3 BAR	15 BARS
			VERY COARSE (2-1)	COARSE (1-0.5)	MEDIUM (0.5-0.25)	FINE (0.25-0.1)	VERY FINE (0.1-0.05)	TOTAL						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
*Honeygrove Clay loam	0-4	A_1	2.1	3.4	1.8	3.3	3.6	14.2	56.4	29.4	Sicl	58.0	48.8	29.8
S55 Oreg. 6-1-(1-8)	4-11	A_3	3.3	2.8	1.7	3.2	3.8	14.8	49.0	36.2	Sicl	34.9	33.8	23.7
LAB NO. SCS	11-24	B_{21}	1.6	2.7	1.6	3.3	3.9	13.1	44.5	42.4	Sic	36.1	33.9	24.0
3450-3457	24-35	B_{22}	1.7	2.1	1.3	2.9	3.6	11.6	41.7	46.7	Sic	37.8	34.8	24.1
SE 1/4,														
NW 1/4,	35-46	B_{31}	0.7	1.0	0.8	2.6	4.5	9.6	38.6	51.8	C	39.1	35.8	25.8
Sec. 9,														
T. 28S.,	46-56	B_{32}	0.1	0.2	0.3	1.9	5.6	8.1	46.7	45.2	Sic	40.2	36.4	25.6
R. 12W.,														
300-400 ft	56-68	B_{33}	0.2	1.7	2.2	9.0	10.3	23.4	41.8	34.8	Cl	47.6	42.5	25.3
west of														
1081 ft.	68-80+	C	0.6	2.6	2.6	10.3	11.5	27.6	44.8	27.6	Cl	51.0	44.5	24.5
Bench mark,														
Coos Co.,														
Oregon														

* Characterization Data by U.S. Soil Conservation Service Riverside, Cal. Lab. Classified as Blachly clay loam when sampled by U.S. Soil Conservation Service and Oregon State Agric. Experiment Station Soil Scientists.

TABLE 16 SOIL PHYSICAL PROPERTIES (Continued)

SOIL NAME, SAMPLE NUMBER, AND LOCATION	DEPTH FROM SURFACE (in.)	HORIZON	PARTICLE SIZE DISTRIBUTION IN MILLIMETERS (Percentage)								TEXTURAL CLASS	MOISTURE HELD AT (Percentage)		
			SAND						SILT (0.05-0.002)	CLAY (0.002)				
			VERY COARSE (2-1)	COARSE (1-0.5)	MEDIUM (0.5-0.25)	FINE (0.25-0.1)	VERY FINE (0.1-0.05)	TOTAL				1/10 BAR	1/3 BAR	15 BARS
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
*Honeygrove Clay loam	0-4	A_1	2.4	6.3	5.3	10.2	7.7	31.9	43.3	24.8	l	46.0	39.7	19.2
S55 Oreg. 6-2-(1-8)	4-11	A_3	2.6	5.9	4.8	8.4	6.4	28.1	40.7	31.2	cl	32.3	29.3	18.7
LAB NO. SCS	11-18	B_{21}	2.7	5.3	4.2	6.8	5.5	24.5	36.6	38.9	cl	29.8	27.2	18.1
3458-3465	18-31	B_{22}	2.0	4.3	3.8	6.1	4.9	21.1	32.7	46.2	C	29.5	26.9	18.2
Near NW Corner of SW 1/4	31-46	B_{31}	1.8	3.4	3.0	5.2	4.2	17.6	28.0	54.4	C	37.3	29.1	20.5
SE 1/4	46-63	B_{32}	1.2	3.2	3.0	5.9	3.5	16.8	26.9	46.3	C	35.4	29.9	21.8
Sec. 20, T. 28 S., R. 12 W.,	63-72	B_{33}	0.9	3.8	3.4	5.8	4.9	18.8	24.2	57.0	C	37.1	30.8	22.4
Coos Co., Oregon	72-78+	C	1.2	5.8	5.6	8.5	5.5	26.6	21.5	51.9	C	33.9	28.5	19.7

* Characterization Data by U.S. Soil Conservation Service Riverside, Cal. Lab. Classified as Blachly Clay loam when sampled by U.S. Soil Conservation Service and Oregon State Agric. Experiment Station Soil Scientists.

TABLE 17 SOIL CHEMICAL PROPERTIES

SOIL NAME, SAMPLE NUMBER AND LOCATION	DEPTH FROM SURFACE (in.)	HORIZON	SOIL REACTION (water 1:1) (pH)	ORGANIC MATTER: CARBON (%)	ORGANIC MATTER: TOTAL NITROGEN (%)	ORGANIC MATTER: CARBON-NITROGEN RATIO	FREE IRON (Fe_2O_3) (%)	EXTRACTIBLE CATIONS (Meq/100gm): Ca	Mg	H	K	CATION EXCHANGE CAPACITY (NH_4OAc) (ME/100g)	BASE SATURATION (NH_4OAc) (%)
* Honeygrove clay loam 555 Oregon 6-1-(1-8) LAB NO. SCS 3450-3457, SE 1/4, NW 1/4, Sec. 9, T 28S., R. 12W., 300 to 400 ft. west of BM @ 1081 ft., near head of Glen Aiken Creek.	0-4	A_1	4.7	12+	0.688	17+	7.3	8.4	4.1	53.3	1.7	41.9	34
	4-11	A_3	4.3	1.70	0.152	11.2	9.5	0.7	1.0	29.0	0.9	23.9	11
	11-24	B_{21}	4.7	1.12	0.098	11.4	10.2	1.1	0.8	26.5	0.7	20.6	13
	24-35	B_{22}	4.7	0.84	0.070	12.0	10.8	1.3	1.2	27.7	0.4	22.2	14
	35-46	B_{31}	4.6	0.33	0.034	9.7	11.6	2.4	1.1	24.5	0.3	22.0	18
	46-56	B_{32}	4.6	0.13	0.015	8.7	11.5	2.6	1.6	22.0	0.2	22.4	20
	56-68	B_{33}	4.8	0.08	0.012	6.7	13.5	1.9	1.4	23.2	0.2	19.5	19
	68-80+	C	4.7	0.08	0.010	8.0	13.5	1.3	1.9	24.7	0.2	19.8	18

* Characterization Data by U.S. Soil Conservation Service Riverside California Lab. Classified as Blachly clay loam when sampled in field by U.S. Soil Conservation Service and Oregon State Agric. Exp. Sta. Soil Scientists.

TABLE 17 SOIL CHEMICAL PROPERTIES - Continued

SOIL NAME, SAMPLE NUMBER AND LOCATION	DEPTH FROM SURFACE (in.)	HORIZON	SOIL REACTION (water 1:1) (pH)	ORGANIC MATTER: CARBON (%)	ORGANIC MATTER: TOTAL NITROGEN (%)	ORGANIC MATTER: CARBON-NITROGEN RATIO	FREE IRON (Fe_2O_3) (%)	EXTRACTIBLE CATIONS (Meq/100gm): Ca	Mg	H	K	CATION EXCHANGE CAPACITY (NH_4OAc) (ME/100g)	BASE SATURATION (NH_4OAc) (%)
* Honeygrove clay loam 555 Oregon 6-2-(1-8) LAB NO. SCS 3458-3465 Near NW corner of SW 1/4 SE 1/4 Sec. 20 T.285., R. 12 W., Coos Co., Oregon	0-4	A_1	5.2	6.41	0.441	14.5	4.1	8.8	2.8	31.8	1.6	33.6	40
	4-11	A_3	4.8	2.51	0.197	12.7	4.9	2.1	1.2	27.0	0.9	22.9	19
	11-18	B_{21}	5.3	1.59	0.136	11.7	5.2	4.9	1.8	19.7	1.0	20.5	38
	18-31	B_{22}	5.2	0.86	0.094	9.1	5.5	4.8	2.4	15.5	0.7	18.6	43
	31-46	B_{31}	4.8	0.45	0.063	7.1	6.2	3.3	2.3	18.9	0.5	18.5	34
	46-63	B_{32}	4.7	0.26	0.051	5.1	6.7	1.9	1.8	20.5	0.3	19.0	22
	63-72	B_{33}	4.4	0.16	0.034	4.7	6.7	1.5	1.4	20.1	0.2	18.8	17
	72-78+	C	4.4	0.11	0.024	4.6	5.3	1.5	1.6	13.4	0.2	17.4	20
Whobrey (501)	0-2	A_{11}	5.3		0.22			6.8	4.0		0.74	22.6	50.6
	2-11	A_{12}	5.2		0.11			4.3	3.4		0.44	16.1	50.5
	11-20	B_2	5.3					3.0	3.6		0.19	14.5	46.8
	20-26	IIC_1	7.2					8.1	8.9		0.26	18.0	100.0
	26-60+	IIC_2	7.4-7.7					12.4	7.3		0.26	16.7	100.0

* Characterization Data by U.S. Soil Conservation Service Riverside, Cal. Lab. Classified as Blachly clay loam when sampled by U.S. Soil conservation Service and Oregon State Agric. Experiment Station Soil Scientists.

TABLE 17 SOIL CHEMICAL PROPERTIES - Continued

SOIL NAME, SAMPLE NUMBER AND LOCATION	DEPTH FROM SURFACE (in.)	HORIZON	SOIL REACTION (water 1:1) (pH)	ORGANIC MATTER: CARBON (%)	ORGANIC MATTER: TOTAL NITROGEN (%)	ORGANIC MATTER: CARBON-NITROGEN RATIO	FREE IRON (Fe_2O_3) (%)	EXTRACTIBLE CATIONS (Meq/100gm): Ca	Mg	H	K	CATION EXCHANGE CAPACITY (NH_4CAc) (ME/100g)	BASE SATURATION (NH_4OAc) (%)
503	0-6	A_1	5.9					0.3	0.16		0.08	9.90	5.4
	6-14	B_1	6.0					0.1	0.16		0.05	6.47	4.8
	14-21	B_{21}	5.8					0.1	0.3		0.04	7.01	6.3
	21-33	B_{22}	6.1					0.1	0.3		0.04	2.99	14.7
	33-50+	C	6.3					0.3	1.3		0.02	6.27	25.8
505	0-7	A_1	4.8					0.1	0.10		0.27	21.8	2.2
	7-18	B_1	4.9					0.3	0.16		0.22	24.6	2.8
	18-29	B_2	5.0					0.3	0.03		0.15	18.8	2.5
520	0-5	A_1	4.9					0.6	0.25			9.85	11.4
	5-11	B_1	4.9					0.1	0.20			9.21	5.3
	11-27	B_{21}	5.0					0.3	0.16			3.67	17.4
	27-40	B_{22}	5.1					0.3	0.16			5.24	10.5
521	0-6	A_1	5.5					0.4	0.3		0.24	6.52	14.4
	6-16	B_{21}	5.7					1.0	0.82		0.16	7.94	25.0
	16-29	B_{22}	5.8					1.2	1.30		0.12	5.10	51.4

TABLE 17 SOIL CHEMICAL PROPERTIES - Continued

SOIL NAME, SAMPLE NUMBER AND LOCATION	DEPTH FROM SURFACE (in.)	HORIZON	SOIL REACTION (water 1:1) (pH)	ORGANIC MATTER: CARBON (%)	ORGANIC MATTER: TOTAL NITROGEN (%)	ORGANIC MATTER: CARBON-NITROGEN RATIO	FREE IRON (Fe_2O_3) (%)	EXTRACTIBLE CATIONS (Meq/100gm): Ca	Mg	H	K	CATION EXCHANGE CAPACITY (NH_4OAc) (ME/100g)	BASE SATURATION (NH_4OAc) (%)
524	0-2	A_{11}	5.3					1.0	0.53		0.44	34.8	5.7
	2-24	A_3	5.3					3.7	1.20		0.86		
	24-42	B_2	5.4					0.7	0.43		0.42	22.9	6.7
524	0-10	A_1	4.8					0.7	0.59		0.35	25.2	6.5
	10-30	A_3	4.9					0.4	0.43		0.26	26.8	4.1
	30-40+	B_2	5.2					0.6	0.92		0.26	18.1	9.8
530	0-11	A_1	4.8					0.1	0.25		0.30	32.7	2.0
	11-33	B_2	5.5					0.3	0.1		0.18	15.3	3.8
Bohannon (63)	0-10	A_1	5.6		0.18			5.9	2.8		0.84	26.4	36.1
	10-27	B_2	5.3					3.7	2.2		0.32	24.8	25.1
	21-26	B_3	5.2					3.5	2.2		0.33	24.6	24.5

TABLE 17 SOIL CHEMICAL PROPERTIES - Continued

SOIL NAME, SAMPLE NUMBER AND LOCATION	DEPTH FROM SURFACE (in.)	HORIZON	SOIL REACTION (water 1:1) (pH)	ORGANIC MATTER: CARBON (%)	ORGANIC MATTER: TOTAL NITROGEN (%)	ORGANIC MATTER: CARBON-NITROGEN RATIO	FREE IRON (Fe_2O_3) (%)	EXTRACTIBLE CATIONS (Meq/100gm): Ca	Mg	H	K	CATION EXCHANGE CAPACITY (NH_4OAc) (ME/100g)	BASE SATURATION (NH_4OAc) (%)
Dement (540)	0-5	A_1	5.2					3.7	1.8		0.82	22.6	28.0
	5-12	B_{21}	5.1					0.7	0.53		0.42	19.9	8.3
	12-18	B_{22}	5.1					0.3	0.25		0.26	20.3	4.0
	18-27	B_{23}	5.3					0.3	0.36		0.19	17.5	4.9
	27-44+	B_3	5.4					0.6	0.30		0.18	15.2	7.1
Etelka (557)	0-13	A_1	5.3		0.30			8.4	4.1		0.70	31.0	42.6
	13-24	B_1	5.4					4.0	4.4		0.32	21.3	40.9
	24-32	B_{21}	5.3					6.4	8.9		0.35	25.0	62.6
	32-45	B_{22}	5.5					8.1	8.9		0.33	24.9	69.6
	45-60	B_3	5.7					10.4	9.9		0.33	26.4	100.00

APPENDIX II- Technical Soil Series Descriptions

(10) BLACHLY SERIES

Taxonomic Class: Umbric Dystrochrepts; Fine, mixed, mesic.

Typifying Pedon: Blachly silty clay loam-forested. (colors are for moist soil unless otherwise noted)

O1 1.5-0" --Undecomposed layer of needles, small branches, leaves and cones; abrupt smooth boundary.

A1 0-3"--Very dusky red (2.5 YR 2/2) silt loam, dusky red. (2.5 YR 3/2) dry; strong fine and medium granular structure; slightly hard, very friable, nonsticky, slightly plastic; many roots; many very fine irregular pores; slightly acid (pH 6.2); abrupt, smooth boundary (2 to 4 inches thick).

A3 3-7"--Dark, reddish brown (2.5 YR 2/4) silty clay loam, reddish brown (2.5 YR 4/4) dry; strong fine and medium subangular blocky structure; slightly hard, very friable, slightly sticky, slightly plastic; many roots; many very fine irregular pores; medium acid (pH 6.0); abrupt smooth boundary. (2 to 6 inches thick).

B1 7-14"--Dark reddish brown (2.5 YR 3/4) silty clay, reddish brown (2.5 YR 4/4) dry; strong fine and medium subangular blocky structure; slightly hard, friable, sticky, plastic; many roots; many very fine tubular pores; medium acid (ph 5.8); clear smooth boundary (5 to 9 inches thick).

B21 14-27"--Dark red (2.5 YR 3/6) silty clay, red (2.5 YR 4/6) dry; moderate medium and strong fine subangular blocky structure; slightly hard, friable, sticky, plastic; few fine roots; many very fine tubular pores; medium acid (pH 5.8); gradual smooth boundary. (10 to 15 inches thick).

B22 27-39"--Dark red (2.5 YR 3/6) silty clay, red (2.5 YR 4/6) dry; moderate fine and medium subangular blocky structure; hard, firm, sticky, plastic; few very fine roots; few partially weathered pebbles; common very fine tubular pores; medium acid (pH 5.6); clear, smooth boundary (10 to 15 inches thick).

B3 39-52"--Yellowish red (5 YR 4/6) silty clay, yellowish red (5 YR 4/6) dry; moderate fine and medium subangular blocky structure; hard, firm, slightly sticky, plastic; few very fine roots; few pebbles; few very fine tubular pores; medium acid (pH 5.6); gradual smooth boundary (10 to 15 inches thick).

C1 52-60+"--Yellowish red (5 YR 4/6) silty clay loam, yellowish red (5 YR 5/6) dry; massive; hard, firm, slightly sticky, slightly plastic; medium acid (pH 5.6).

Type Location: Coos County, Oregon. Approximately 1000 ft. north and 1500 ft. west of SE corner Section 35, T. 27 S., R. 12 W., Blue Ridge.

(14) HONEYGROVE SERIES

Taxonomic Class: Typic Haplohumults; clayey, mixed, mesic.

Typifying Pedon: Honeygrove clay loam-clearcut (colors are for moist soils unless otherwise noted)

O1 1.5-0"--Bracken Fern litter

A1 0-8"--Dark reddish brown (5 YR 3/3) clay loam, reddish brown (5 YR 5/4) dry; moderate few granular structure; friable; sticky, plastic; many roots; few fine intenstitial pores; few cobbles (1%); slightly acid (pH 6.2); clear wavy boundary. (6 to 10 inches thick).

B1 8-24"--Dark red (2.5 YR 3/6) clay, dark reddish brown (2.5 YR 3/4) dry; strong medium subangular blocky structure; firm, sticky, plastic, common roots; many very fine and few medium tubular pores; few cobbles (1%); medium acid (pH 5.9); clear wavy boundary. (12 to 20 inches thick).

B21t 24-42"--Dark reddish brown (2.5 YR 3/4) clay, red (2.5 YR 4/6) dry; moderate medium prismatic to strong medium and fine subangular blocky structure; very hard, very firm, very sticky and very plastic; few roots; many very fine and few medium tubular pores; many moderately thick clay films on peds and in pores; few pebbles (<1%); strongly acid (pH 5.5); gradual smooth boundary. (15 to 20 inches thick).

B22t 42-75+"--Dark reddish brown (2.5 YR 3/4) clay; strong medium prismatic structure; very hard, very firm, very sticky and very plastic; few roots; many very fine tubular pores; continuous, thick clay films on peds and in pores; few pebbles (<1%); strongly acid (pH 5.4).

Type Locations: Douglas County, Oregon. NE 1/4 Section 19, T. 22 S., R. 8 W., cut bank along east side of BLM Road 22-8-18.0.

(50) APT SERIES

Taxonomic Class: Typic Haplohumults; clayey, mixed, mesic.

Typifying Pedon: Apt clay loam-clearcut
(colors are for moist soil unless otherwise noted)

O1 2-0"--Leaves, twigs, and ferns

A11 0-4"--Very dark grayish brown (10YR 3/2) clay loam, brown (10YR 5/3) dry; moderate fine and medium granular structure; soft, very friable, slightly sitcky, slightly plastic; many roots; many fine irregular pores; 5 percent pebbles; medium acid (pH 5.6); clear, smooth boundary. (2 to 6 inches thick)

A12 4-12"--Dark yellowish brown (10YR 3/4) heavy clay loam, pale brown (10YR 6/3) dry; moderate fine and medium subangular blocky structure; soft very friable, slightly sticky, slightly plastic; many roots; common fine irregular pores; 10 percent pebbles; strongly acid (pH 5.2); clear, smooth boundary. (4 to 10 inches thick).

B1t 12-20"--Dark brown (7.5YR 4/4) silty clay loam, brown (7.5YR 5/4) dry; weak to moderate medium subangular blocky structure; slightly hard, friable, sticky, plastic; common roots; common very fine tubular pores; common, thin clay films; strongly acid (pH 5.1); clear, smooth boundary. (6 to 10 inches thick).

B21t 20-35"--Brown (7.5YR 5/4) silty clay, light yellowish brown (10YR 6/4) dry; moderate fine and medium subangular blocky structure; slightly hard, friable, sticky, plastic; few roots; very fine tubular pores; common, thin and few thick clay films; strongly acid (pH 5.1); clear, smooth boundary; (12 to 18 inches thick).

B22t 35-60+"--Dark brown (7.5YR 4/4) silty clay (moist or dry); strong, medium subangular blocky structure; hard, firm, sticky, plastic; few roots; few, very fine tubular pores; many moderately thick and thick clay films; very strongly acid (pH 4.8).

Type Location: Along BLM Road 22-8-17.0 in NW 1/4 of Section 17, T. 22 S., R. 8 W.

(54) SLICKROCK SERIES

Taxonomic Class: Pachic Haplumbrept; fine loamy, mixed, mesic.

Typifying Pedon: Slickrock gravelly loam-forested. (Colors are for moist soil unless otherwise noted).

O1 1-0"--Needles, fern fronds, small branches and cones; abrupt, smooth boundary. (1 to 3 inches thick).

A11 0-5"--Very dark brown (7.5YR 2/2) gravelly loam, dark grayish brown (7.5YR 4/2) dry; moderate very fine and fine granular structure; soft, friable, slightly sticky, slightly plastic; many roots; many very fine irregular pores; 20% pebbles; very strongly acid (pH 4.8); clear smooth boundary. (3 to 7 inches thick).

A12 5-12"--Very dark brown (7.5YR 2/2) gravelly loam, dark grayish brown (7.5YR 4/2) dry; moderate very fine and fine granular structure; soft, friable, slightly sticky, slightly plastic; many roots; common very fine irregular pores; 25% pebbles; very strongly acid (pH 4.9); clear smooth boundary. (2 to 6 inhes thick).

B21 12-26"--Very dark brown (10YR 2/2) gravelly clay loam, dark grayish brown (10YR 4/2) dry; moderate very fine subangular blocky structure; soft, friable, slightly sticky, slightly plastic; common roots; common very fine tubular pores; 20% pebbles; strongly acid (pH 5.1); clear smooth boundary. (12 to 16 inches thick).

B22 26-44"--Very dark grayish brown (7.5YR 3/2) gravelly clay loam, dark brown (10YR 4/3) dry; moderate fine subangular blocky structure; soft friable, slightly sticky, slightly plastic; few roots; common fine tubular pores; 25 percent rock fragments; strongly acid (pH 5.2); clear smooth boundary. (15 to 20 inches thick).

B3 44-66"--Dark brown (7.5YR 3/3) gravelly clay loam, brown (7.5YR 5/3) dry; weak, medium subangular blocky structure; soft, friable, slightly sticky, slightly plastic; few roots, common, fine pores; 40% rock fragments; very strongly acid (pH 4.7); clear smooth boundary. (15 to 25 inches thick).

C1 66"+--Yellowish brown (10YR 5/6) paralithic sandstone.

Type Location: Coos County, Oregon. The site is located in the NE 1/4, NE 1/4 Section 29, T. 29 S., R. 9 W. It is located on the east side of BLM road 29-9-28.0 approximately 0.3 miles from the junction of BLM road 29-9-29.0.

(57) PREACHER SERIES

Taxonomic Class: Typic Haplumbrepts; fine loamy, mixed, mesic.

Typifying Pedon: Preacher clay loam - forested
(colors are for moist soil unless otherwise noted)

O1 1-0"--Partially decayed stems, cones, needles and leaves.

A1 0-10"--Dark brown (7.5YR 3/2) clay loam, brown (7.5YR 5/3) dry; moderate fine granular structure; slightly hard, friable, slightly sticky, slightly plastic; many very fine irregular pores; many roots; strongly acid (pH 5.3); gradual smooth boundary; 7 to 12 inches thick.

B21 10-32" Brown (7.5YR 4/4) clay loam (moist or dry); weak medium subangular blocky structure. Slightly hard, friable, slightly sticky, slightly plastic; many very fine roots; many very fine tubular pores; 5 to 10% pebbles. Strongly acid (pH 5.0); gradual smooth boundary. 18 to 25 inches thick.

B22 32-66"--Dark yellowish brown (10YR 4/4) clay loam, dark brown (7.5YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky, slightly plastic; many fine tubular pores; common roots; 10% pebbles. Very strongly acid (pH 4.8). Clear, smooth boundary. 25 to 35 inches thick.

C1 66"+--Weathered, paralithic sandstone bedrock.

Type Location: Coos County, Oregon; NW 1/4 of Section 27, T. 25 S., R. 10 W., on south side of Weyerhaeuser 5000 road.

(63) BOHANNON SERIES

Taxonomic Class: Typic Haplumbrept; fine loamy, mixed, mesic.

Typifying Pedon: Bohannon gravelly clay loam - forested (colors are for moist soil unless otherwise noted)

O1 2-0"--Partially decayed stems, cones and needles.

A1 0-10"--Very dark grayish brown (10YR 3/2) gravelly clay loam, dark grayish brown (10YR 4/2) when dry; moderate fine granular structure; soft, friable, slightly sticky, slightly plastic; many roots; many very fine irregular pores; medium acid (pH 5.6); gradual smooth boundary. (7 to 12 inches thick).

B2 10-21"--Dark grayish brown (10YR 4/2) gravelly clay loam, grayish brown (10YR 5/2) when dry; weak fine and very fine subangular blocky structure; soft, friable, slightly sticky, slightly plastic; common roots; many fine pores; 15 to 20% pebbles, cobbles and stones; strongly acid (pH 5.3); gradual smooth boundary. (8 to 15 inches thick).

B3 21-34"--Dark yellowish brown (10YR 3/4) gravelly loam, brown (10YR 5/3) dry; weak very fine subangular blocky structure; soft, friable, slightly sticky, slightly plastic, many fine pores; common roots; 25% pebbles, cobbles and stones; strongly acid (pH 5.2); clear smooth boundary. (10 to 15 inches thick).

C1 34"+--Strongly weathered, unconsolidated arkosic sandstone.

Type Location: Coos County, Oregon; SE 1/4 Section 13, T. 27 S., R. 10 W. About 650 ft. east and 150 ft. north of junction BLM spur roads 27-10-13.0 (Skeeter Camp Rd.) and 27-10-13.1 (Burnt Mt. Cabin).

(64) JASON SERIES

Taxonomic Class: Dystric Eutrochept; loamy-skeletal, mixed, mesic, shallow.

Typifying Pedon: Jason gravelly loam - clearcut.
(colors are for moist soil unless otherwise noted)

O1 1-0"--Douglas fir needles, cones and bark, rhododendron and evergreen huckleberry leaves.

A1 0-5"--Dark grayish brown (10YR 4/2) gravelly loam, grayish brown (10YR 5/2) dry; moderate fine subangular blocky structure soft, friable, nonsticky and nonplastic; many very fine, fine and medium roots.; many very fine and fine interstitial pores; 45% pebbles and cobbles; slightly acid (pH 6.0); smooth clear boundary. (3 to 8 inches thick).

B2 5-15"--Brown (10YR 4/3) very gravelly loam, pale brown (10YR 6/3) dry; moderate medium subangular blocky structure; slightly hard, friable, nonsticky, nonplastic; many very fine, fine, medium and few coarse roots; many very fine to medium tubular and irregular pores; 60 percent pebbles; slightly acid (pH 6.2); abrupt irregular boundary. (10 to 15 inches thick).

C1 15"+--Slightly hard, highly fractured sandstone; fractures are 2 to 6 inches apart.

Type Location: Douglas County, Oregon. The site is located in the NW 1/4 of Section 7, T. 21 S., R. 9 W. The site is located on the north side of BLM Road 21-10-12.1 approximately 1.4 miles from the Wassen Lake road junction.

(66) DIGGER SERIES

Taxonomic Class: Dystric Eutrochrepts; loamy-skeletal, mixed, mesic.

Typifying Pedon: Digger gravelly loam - Forested
(colors are for moist soil unless otherwise noted)

O1 1-0"--Partially decomposed litter from salal leaves and Douglas fir needles.

A1 0-8"--Dark yellowish brown (10YR 3/4) gravelly loam, light brownish gray (10YR 6/2) dry; weak very fine granular structure; loose, nonsticky, nonplastic; many fine and few medium roots; many fine and very fine pores; 25% rock fragments; slightly acid (pH 6.4). Abrupt smooth boundary. (6 to 12 inches thick).

B1 8-18"--Dark brown (10YR 4/3) gravelly silt loam, pale brown (10YR 6/3) dry; moderate medium subangular blocky structure; soft, friable, nonsticky, nonplastic; common fine and many very coarse roots; many very fine and common fine pores; 30% rock fragments 1 inch in diameter or less; slightly acid (pH 6.2); clear smooth boundary. (6 to 12 inches thick).

B2 18-34"--Yellowish brown (10YR 5/4) gravelly heavy silt loam, very pale brown (10YR 7/3) dry; moderate medium subangular blocky structure; soft, friable, slightly sticky, slightly plastic; few fine and medium roots; many very fine and common fine pores; 50% rock fragments 1.5 inches in diameter or less; slightly acid (pH 6.2); clear wavy boundary. (12 to 20 inches thick).

B3 34-39"--Yellowish brown (10YR 5/6) very gravelly silt loam, very pale brown (10YR 7/3) dry; weak medium subangular blocky structure; slightly hard, firm, nonsticky, nonplastic; few fine roots; common fine pores; 70% rock fragments 2.0 inches in diameter or less; Medium acid (pH 6.0); clear wavy boundary. (3 to 5 inches thick).

C1 39-58"+--Strongly weathered unconsolidated, fractured siltstone and sandstone. (paralithic contact).

Type Location: Douglas County, Oregon. The site is along a road cut on south Fork Access Road approximately 750 ft. south of sandstone rock quarry in the SE 1/4, NE 1/4 Section 13, T. 21 S., R. 6 W.

Taxonomic Class: Dystric Eutrochrept; loamy-skeletal, mixed, mesic.

Typifying Pedon: Unit 166 gravelly loam-forested. (colors are for moist soil unless otherwise noted).

O1 2-0"--Partially decomposed litter from salal and Oregon grape leaves and Douglas fir needles.

A1 0-7"--Dark yellowish brown (10YR 3/4) gravelly loam, light brownish gray (10YR 6/2) dry; weak very fine granular structure; loose, nonsticky, nonplastic; common fir and few medium roots; common fine and very fine pores; 20% rock fragments; slightly acid (pH 6.2). Abrupt smooth boundary. (6 to 8 inches thick).

B1 7-18"--Dark grayish brown (10YR 4/2) gravelly loam, light brownish gray (10YR 6/2) dry; moderate medium subangular blocky structure; soft, friable, nonsticky, nonplastic; common fine and few very coarse roots; common very fine and fine pores; 25% rock fragments 1 inch in diameter or less; slightly acid (pH 6.2); clear smooth boundary. (5 to 10 inches thick).

B2 18-29"--Yellowish brown (10YR 5/4) gravelly heavy loam, very pale brown (10YR 7/4) dry; moderate fine and medium subangular blocky structure; soft, friable, slightly sticky, slightly plastic; few fine and medium roots; common very fine and fine pores; 45% rock fragments 1.5 inches in diameter or less; slightly acid (pH 6.3); clear wavy boundary. (10 to 15 inches thick).

B31 29-36"--yellowish brown (10YR 5/6) very gravelly loam, very pale brown (10YR 7/4) dry; weak fine and medium subangular blocky structure; slightly hard, firm, nonsticky, nonplastic; few fine roots; common fine and medium pores; 60% rock fragments; 2.0 inches in diameter or less; medium acid (pH 6.0); clear wavy boundary. (5 to 10 inches thick).

B32 36-44"--Yellowish brown (10YR t/8) very gravelly loam, very pale brown (10YR 7/3) dry; weak medium subangular blocky structure, slightly hard, firm, nonsticky, nonplastic; few fine roots; common fine and medium pores; 75% rock fragments; 2.0 inches in diameter or less; medium acid (pH 5.8); clear wavy boundary. (6 to 12 inches thick).

C1 44-60"+--Strongly weathered unconsolidated, fractured siltstone and sandstone. (paralithic contact).

Type Location: SW 1/4 Section 1, T. 22. S., R. 10 W. North cutbank of USFS Rd. 2175 and about 250 feet from end of road.

Range in Characteristics: The soils are usually moist but are dry between 4 and 12 inches for less than 45 consecutive days in 6 out of 10 years within the 3 month period following the summer solstice. The mean summer temperature ranges from 47 to 55°F. The solum is 3 to 4 feet thick. Depth to strongly weathered and fractured sandstone and siltstone is 40 to 60 inches and depth to unfractured rock is deeper than 60 inches. Rock fragment content is between 20 and 40 percent in the A horizon and between 35 and 75 percent in the B horizon. The A horizon has a hue of 10YR or 7.5YR, a value of 3 or 4 moist and 4 or 5 dry and chroma of 4,5 or 6 moist and dry. It has weak or moderate very fine or fine granular or subangular blocky structure. The reaction is slightly or medium acid and the thickness ranges from 6 to 8 inches. The texture is gravelly loam or gravelly silt loam. The B horizon has a hue of 10YR or 7.5 YR, a value of 4 or 5 moist and 5,6or 7 dry. It has moderate or weak medium subangular blocky structure. The texture is very gravelly or very cobbly loam, silt loam or light clay loam.

Competing Soils and Their Differentiae: These are the Digger, Unit 530, Unit 521, Coyata, Straight, Vena and Unit 505 soils. Digger soils are moderately deeper and Unit 530 soils have umbric epipedons and are moderately deep. Unit 521 soils have hues of 5YR and formed in materials derived from volcanic rocks. Coyata soils have 5YR hures and umbric epipedons. Straight soils have bues of 5YR in the A horizon and formed in materials weathered from reddish breccia bedrock. Vena soils formed in materials weathered from fractured rhyolitic tuff bedrock. Unit 505 soils have 5YR hues in the B horizon and are moderately deep over a fragmental C horizon.

Setting: Unit 166 soils are on steep and very steep ridgetops and sideslopes at elevations between 200 and 3000 feet. Slope gradients grnerally range from 35 to 80 percent. The soils formed in medium textured gravelly colluvium from arkosic sandstone and siltstone of Eocene age. Unit 166 soils formed in a marine climate having an annual precipitation of 60 to 100 inches with a dry summer season; a mean annual temperature of about 52°F., an average January temperature of 43°F.; and an average July temperature of 62°F. The average frost-free period is about 190 days. Unit 166 soils are usually moist and are dry between depths of 4 and 12 inches for less than 45 consecutive days during the dry summer season.

Principal Associated Soils: These are the competing moderately deep, loamy-skeletal Digger soils; the shallow loamy-skeletal Jason soils; the fine-loamy Bohannon soils and the deep, fine-loamy Preacher soils.

Drainage and Permeability: Well drained; medium to rapid runoff when vegetation is removed; moderately rapid permeability.

Use and Vegetation: Unit 166 soils are used for timber production, water supply and wildlife. The dominant trees on this soil are Douglas fir, big leaf maple and red alder. The understory is mixed shrubs and herbs, including bracken fern, Oregon grape, and salal.

Distribution and Extent: The soil is inextensive in Southwestern Oregon within the region underlain by Eocene sandstone.

Series Proposed: Lane County(Eugene BLM District) Oregon 1974.

(501) WHOBREY SERIES

Taxonomic Class: Aquic Eutrochrepts (tentative); fine-silty over clayey, mixed, mesic.

Typifying Pedon: Whobrey silt loam - forested regrowth after clearcut. (Colors are for moist soil unless otherwise noted).

O1 1-0"--Litter of undecomposed fern leaves, twigs, needles, grass, abrupt, smooth boundary.

A11 0-2"--Dark brown (10YR 3/3) silt loam, light brownish gray (10YR 6/2) when dry; moderate, medium, granular structure; slightly hard, very friable, slightly sitcky and slightly plastic; many, very fine to medium roots; many, very fine to medium, tubular and interstitial pores; medium acid (pH 5.8, CPR); clear, wavy boundary. 1 to 5 inches thick.

A12 2-11"--Brown (10YR 4/3) silt loam, pale brown (10YR 6/3) when dry; weak, fine and medium, subangular blocky structure; hard, friable, slightly sticky and slightly plastic; many, very fine to medium roots; common, very fine and fine, tubular and interstitial pores; medium acid (pH 5.6); gradual, wavy boundary. 5 to 11 inches thick.

B2 11-20"--Dark yellowish-brown (10YR 4/4) heavy silt loam, pale brown (10YR 6/3) when dry; moderate, medium and coarse, subangular blocky structure; hard, friable, slightly sitcky and slightly plastic; common, very fine to medium roots; common, very fine and fine, tubular and interstitial pores; medium acid (pH 5.6); clear, wavy boundary. 7 to 14 inches thick.

IIC1 20-26"--Very dark gray (5Y 3/1) clay, gray (5Y 5/1) when dry; moderate, coarse and very coarse, angular blocky structure; extremely hard, very firm, very sticky and very plastic; slickensides; few, very fine and fine, flattened roots; few, very fine, interstitial pores; about 1 percent coarse fragments, mostly rounded pebbles; neutral (pH 6.8, BTB); gradual, wavy boundary. 4 to 10 inches thick.

IIC2 26-60"--Very dark gray (5Y 3/1) clay, gray (5Y 5/1) when dry; massive; extremely hard, very firm, very sticky and very plastic; slickensides; very few, very fine, flattened roots; very few, very fine, interstitial pores; 2 to 5 percent pebbles, many rounded; moderately alkaline (pH 8.2 PR).

Type Location: Coos County, Oregon. About 500 feet north, 100 feet west of the S 1/4 corner of Section 35, T. 29 S., R. 12 W., W.M. (In SE 1/4 SE 1/4, SW 1/4); approximately 3 miles east of Broadbent, Oregon in a road cut on the south side of BLM road, south of a landing.

503 SERIES

Taxonomic Class: Typic Dystrochrept; fine-loamy, serpentinitic, mesic.

Typifying Pedon: Unit 503 cobbly silty clay-forested. (colors are for moist soil unless otherwise noted).

O1 0-1"--Rhododendron, Laborador Tea, Manzanita, Knobcone pine, Tan Oak, Lodgepole Pine leaves, twigs and needles.

A1 0-6"--Dusky red (10R 3/4) cobblysilty clay loam, moist or dry; weak and moderate very fine granular structure; slightly hard, friable, sticky, slight plastic; many fine and medium and few coarse roots; many fine interstitial pores; 10 to 30% blocky peridotite rock fragments (4-10 long axis); medium acid (pH 5.9); clear smooth boundary. (4 to 8 inches thick).

B1 6-14"--Dark red (10R 3/6) cobbly silty clay loam, moist or dry; cobbles have dusky red (10R 3/4) coatings of iron and manganese; moderate very fine granular or subangular blocky structure; slightly hard, firm, very sticky, plastic; common fine and medium and few coarse roots; common fine interstitial pores; 10 to 30% peridotite blocky rock fragments (4-10" long axis); medium acid (pH 6.0); clear smooth boundary. (6 to 10 inches thick).

B21 14-21"--Red (2.5YR 4/6) cobbly silty clay loam, moist or dry; moderate very fine and fine subangular blocky structure; slightly hard, firm, very sticky, plastic; few medium and coarse roots; many fine interstitial pores; 25 to 35% blocky peridotite rock fragments (4-12" long axis); medium acid (pH 5.8); clear smooth boundary. (5 to 10 inches thick).

B22 21-33"--Yellowish red (5YR 4/6) cobbly heavy silty clay loam, moist or dry; moderate and strong fine subangular blocky structure; hard, firm, very sticky, plastic; few medium and coarse roots; common medium interstitial and few medium and coarse tubular pores; 25 to 35% blocky peridotite rock fragments (8-12" long axis); slightly acid (pH 6.1); clear smooth boundary. (10 to 15 inches thick).

C1 33-50"-Strong brown (7.5YR 5/6) very cobbly silty clay loam, moist or dry; strong coarse blocky structure; hard, firm, very sticky, plastic; few medium and coarse roots; few medium and coarse tubular pores; 60 to 70% blocky peridotite and partially serpentinized peridotite rock fragments (2-30" long axis); slightly acid (pH 6.3); clear smooth boundary (10 to 20 inches thick).

R 50"+ --Reddish-black fractured peridotite and greenish-black serpentinite bedrock.

Type Location: SE 1/4 Section 13, T. 37 S., R. 14 W. Approximately 10 feet from South 1/4 corner section 13/24 in east cutbank of USFS Rd. 368.

Range in Characteristics: The soils are usually moist but may be dry between 4 and 12 inches for less than 45 consecutive days in 6 out of 10 years within the 3 month period following the summer solstice. The mean summer temperature ranges from 47 to 55°F. The solum is 2 1/2 to 3 1/2 feet thick. Depth to the R horizon is 40 to 60 or more inches. Rock fragment content is between 10 and 30 percent in the A horizon and between 10 and 35 percent in the B horizon. The A horizon has a hue of 10R or 2.5YR, a value of 3 or 4 moist and dry and chroma of 3,4 or 6 moist and dry. It has weak or moderate very fine or fine granular or subangular blocky structure. The reaction is medium acid or strongly acid and the thickness ranges from 4 to 8 inches. The texture is cobbly or stony clay loam or silty clay loam.

The B horizon has a hue of 10R, 2.5YR or 5YR, a value of 3 or 4 moist and dry and chroma of 6 or 8 moist and dry. It has moderate or strong fine or very fine granular or subangular blocky structure. The texture is cobbly or gravelly silty clay loam or heavy clay loam. The C1 horizon is very cobbly (50% rock fragments 3-10" long axis). The R horizon is composed of fractured peridotite, serpentinite and partially serpentinized bedrock.

Competing Soils and Their Differentiae: These are the 505, 520, 521, Sebastian, and Cornutt soils. Unit 505 soils have loamy skeletal B horizons, fragmental C, horizons and a xeric moisture regime. Unit 520 and 521 soils formed in materials derived from old volcanic bedrock and have a xeric moisture regime. Sebastian soils are shallow to serpentinitic bedrock and have very strong argillic horizons. Cornutt soils are moderately deep to serpentinitic bedrock and have neutral argillic horizons and xeric moisture regimes.

Setting: Unit 503 soils are a gently sloping to steep mountainous uplands at elevations of 200 to 2800 feet. Slope gradients range from 10 to 60%. They formed in colluvium and residuum weathered from serpentinite and peridotite. The climate is mild humid marine type, with a mean annual precipitation of 60 to 100 inches, and a dry summer period of less than 45 days. The mean annual temperature is about 52°F.; the average January temperature is about 45°F., and the average July temperature is about 59°F. The frost-free period is about 220 days.

Principal Associated Soils: These are the deep, red, clayey Edson and the moderately deep, loamy-skeletal Unit 505 series on adjacent areas underlain by schistose slate; the soils of the Dement and Unit 530 series on adjacent areas underlain by sedimentary rocks; Rock land; and with unclassified, unnamed shallow, loamy-skeletal soils from serpentinite that are treated as an inclusion in this inventory.

Drainage and Permeability: Well drained; slow to rapid runoff; moderate permeability.

Use and Vegetation: Unit 503 soils are used for recreation, water supply, mining and by wildlife. The dominant tree on this soil is knobcone pine and some Jeffrey pine, lodgepole pine, stunted Port Orford cedar, and Pacific madrone. The understory is mixed shrubs and herbs, including manzanita, rhododendron, labrador tea, tan oak, and azalea.

Distribution and Extent: Occurs to a limited extent in Southwestern Oregon within the region underlain by ultramafic rocks.

505 SERIES

Taxonomic Class: Dystric Xerochrepts; loamy-skeletal over fragmental, mixed, mesic.

Typifying Pedon: Unit 505 gravelly silt loam-forested
(Colors are for moist soil unless otherwise noted)

O1 0-2"--Tanoak, madrone, bracken fern, Douglas fir and Salal twigs, needles and fronds.

A1 0-7"--Dark yellowish brown (10YR 3/4) gravelly (channery) silt loam, brown (7.5YR 5/4) and strong brown (7.5YR 5/6) dry; weak and moderate very fine granular and subangular blocky structure; hard, friable, slightly sticky, slightly plastic; many fine and medium and few coarse roots; many fine tubular pores; 35 to 50 percent subangular pebbles and schistose fragments 3-4" long axis; very strongly acid (pH 4.8); clear smooth boundary. (6 to 10 inches thick).

B1 7-18"--Dark reddish brown (5YR 3/3) light gravelly clay loam, light reddish brown (5YR 6/4), dry; moderate very fine granular and subangular blocky structure; hard, friable, slightly sticky, slightly plastic; common fine and medium and few coarse roots; many fine tubular pores. 30 to 50% subangular pebbles; very strongly acid (pH 4.9) clear wavy boundary. (8 to 15 inches thick).

B2 18-29"--Brown (7.5YR 4/4) very gravelly silty clay loam, reddish yellow (7.5YR 6/6) dry; strong very fine, fine and medium subangular blocky structure; hard, friable to firm; sticky,

plastic; few fine and medium roots; many very fine and common fine pores; 40 to 60% rock fragments; very strongly acid (pH 5.0); clear wavy boundary. (8 to 15 inches thick).

C1 29-45"--Highly fractured schistose slate with soil in the cracks.

Type Location: Cutbank along BLM road 35-13-30.0, 0.25 mile east of W 1/4 corner of section 15, T. 35 S., R. 13 W.

Range in Characteristics: The soils are usually moist but are dry between 4 and 12 inches for more than 45 consecutive days in 6 out of 10 years within the 3 month period following the summer solstice. The mean summer temperature ranges from 47 to 55°F. The solum is 2 to 3 feet thick. Depth to highly fractured schistose slate is 20 to 40 inches and depth to unfractured rock is deeper than 40 inches. Rock fragment content is between 35 and 50 percent in the A horizon and between 40 and 75 percent in the B horizon. The A horizon has a hue of 10YR or 7.5YR, a value of 3 or 4 moist and 4 or 5 dry and chroma of 4, 5 or 6 moist and dry. It has weak or moderate very fine or fine granular or subangular blocky structure. The reaction is very strongly or strongly acid and the thickness ranges from 6 to 10 inches. The texture is gravelly loam or gravelly silt loam.

The B horizon has a hue of 5YR or 7.5YR, value of 3 or 4, moist and 5 or 6, dry and chroma of 3 or 5, moist and 4,5 or 6, dry. It has moderate or strong fine or very fine granular or medium subangular blocky structure. The texture is very gravelly loam, very gravelly clay loam, very gravelly silt loam, or very gravelly silty clay loam. The C1 horizon is weathered, highly fractured schistose rocks.

Competing Soils and their Differentiae: These are the 530, 520, 521, Digger, Coyata, Straight and Vena soils. Unit 530 soils have an umbric epipedon, 520 soils lack skeletal B horizons, have hues of 2.5Y in the B horizon and have formed in materials from underlying old volcanic bedrock at depths greater than 40 inches. Unit 521 soils have formed in materials derived from old volcanic rocks. Digger soils have hues of 10YR in the B horizon and formed in materials weathered from Eocene sandstone. Coyata soils have 5YR hues and rock fragment content of less than 25 percent in the A horizon, which is umbric. Straight soils have hues of 5 YR in the A horizon and formed in materials weathered from reddish breccia bedrock. Vena soils have hues of 10YR in the B horizon and formed in materials weathered from fractured rhyolitic tuff bedrock.

Setting: Unit 505 soils are on steep mountainous uplands at elevations between 200 and 2800 feet. Slope gradients range from 35 to 60 percent. They formed in colluvium and residuum weathered from schistose slate, schist and quartz-phyllite of the Colebrooke schist formation. Rock fragments are scattered throughout the material and fractured bedrock occurs at depths less than 40 inches. The climate is a mild humid marine type with a mean annual percipitation of 60 to 120 inches and a

dry summer period of more than 45 consecutive days in 7 out of 10 years. The mean annual temperatue is about 50° to 52° F.; the average January temperature is about 45° F., and the average July temperature is about 59°F. The frost free period is about 220 days.

Principal Associated Soils: These are the competing, moderately deep loamy-skeletal Unit 530 soils from graywacke; the deep, red clayey Dement soils from graywacke; the deep, red clayey Edson soils from schistose slate, quartz-phyllite and schist; the deep, red, fine-loamy Unit 503 soils from serpentine and peridotite and Rock land.

Drainage and Permeability: Well drained; slow to rapid runoff; moderately rapid permeability.

Use and Vegetation: Unit 505 soils are used for timber production, water supply and by wildlife. The dominant trees on this soil are Douglas fir, western hemlock, red alder and tanoak. The understory is mixed shrubs and herbs, including tanoak, madrone, bracken fern and salal.

Distribution and Extent: The soil is inextensive in southwestern Oregon within the region underlain by schistose rocks of the Colebrooke Schist Formation.

Series Proposed: Curry County (Coos Bay District, BLM), Oregon 1974.

520 SERIES

Taxonomic Class: Dystric Xerochrepts; fine-loamy, mixed, mesic.

Typifying Pedon: Unit 520 loam
(colors are for moist soil unless otherwise noted)

A1 0-5"--Erosion pavement on surface-Dark reddish brown (5YR 3/3) loam, reddish brown (5YR 5/3) dry; moderate fine and medium granular structure; soft, friable, nonsticky, nonplastic; many fine and medium roots; many fine tubular pores; about 5 percent rock fragments; very strongly acid (pH 4.9); clear wavy boundary. (4 to 8 inches thick).

B1 5-11"--Dark reddish brown (5YR 3/4) gravelly and cobbly clay loam; yellowish red (5YR 4/4) dry; moderate fine and medium subangular blocky structure; slightly hard, friable, sticky, plastic; many fine and medium roots; many fine tubular pores; 10 to 15 percent rock fragments; very strongly acid (pH 4.9); clear smooth boundary. (5 to 10 inches thick).

B21 11-27"--Red (2.5YR 5/6) cobbly silty clay loam moist or dry; moderate medium and coarse subangular blocky structure; hard, firm, very sticky, very plastic; many fine and medium roots; common

fine and medium and few coarse roots; common fine tubular pores; 20 percent rock fragments; few thin clay films in pores and on ped faces. Very strongly acid (pH 5.0); clear smooth boundary. (12 to 18 inches thick).

B22 27-42"--Red (2.5YR 4/8) cobbly silty clay loam moist or dry; moderate medium and coarse subangular blocky structure; hard, firm, very sticky, very plastic; few fine, medium and coarse roots; common fine tubular pores; 25 percent rock fragments; common, moderately thick clay films in pores and on ped faces; strongly acid (pH 5.0); clear smooth boundary. (10 to 15 inches thick).

C1 40-47"+--Strongly weathered old volcanic bedrock.

Type Location: Center of SE 1/4 section 10, T. 40 S., R. 13 W., in cutbank of BLM Road 40-13-11.2.

Range in Characteristics: The soils are usually moist but are dry between 4 and 12 inches for more than 45 consecutive days in 6 out of 10 years within the 3 month period following the summer solstice. The mean summer temperature ranges for 47° to 55° F. The solum is 3 1/2 to 4 1/2 feet thick. Depth to bedrock is between 40 and 60 inches. Rock fragment content is between 2 and 10 percent in the A horizon and between 5 and 35 percent in the B horizon. The A horizon has a hue of 5YR or 7.5YR, value of 4 or 5 moist and dry and chroma of 2 or 3 moist and dry. It has moderate fine or medium granular or subangular blocky structure; it is very strongly or strongly acid and the thickness ranges from 4 to 8 inches. The texture is loam or light clay loam.

The B horizon has a hue of 2.5YR or 5YR, value of 3, 4 or 5 moist and dry. The chroma in the upper B horizon is 4 or 5 moist and dry. The chroma in the lower B horizon is 6 or 8 moist or dry. The texture is cobbly light clay loam or cobbly light silty clay loam. The structure is moderate or strong medium and coarse subangular blocky. The C1 horizon is highly weathered saprolite from the old volcanic bedrock member of the Dothan Formation.

Competing Series and Their Differential: These are the 505, 521, 530, Digger, Coyata, Straight and Vena soils. Unit 505 soils have 10YR hues in the A horizon and skeletal B horizons. Unit 521 soils are moderately deep over underlying, fragmental old volcanic bedrock and have skeletal B horizons. Unit 530 soils have an umbric epipedon, skeletal B horizon and formed in weathered material from graywacke. Digger soils have 10YR hues throughout the solum, skeletal B horizons, and have formed in materials weathered from Eocene sandstone. Coyata soils have umbric epipedons, skeletal B horizons, formed in materials from basalt rock and are slightly or medium acid throughout. Both Straight and Vena soils have skeletal B horizons and Vena soils have 10YR hues in the A horizons.

Setting: Unit 520 soils are on moderately steep to very steep buttes and ridges in mountainous uplands at elevations between 500 and 2800 feet. Slope gradients range from 10 to 80 percent with most areas being steeper than 35 percent. Unit 520 soils formed in colluvium and residuum weathered from old volcanic members of the Dothan Formation. Bedrock occurs at depths below 40 inches. The climate is a mild humid marine type with a mean annual precipitation of 60 to 120 inches and a dry summer period of at least 45 consecutive days in 6 out of 10 years. The mean annual temperature is about 52° F. The average January temperature is about 47° F.; and the average July temperature is about 60° F. The frost free period is about 220 days.

Principal Associated Soils: These are the moderately deep, red, loamy-skeletal 521 soils from old volcanic rocks; the deep, red, clayey Dement soils; the moderately deep, loamy-skeletal 530 soils from graywacke; and Rock land.

Drainage and Permeability: Well drained; slow to rapid runoff; moderate permeability.

Use and Vegetation: Unit 520 soils are used for recreation, water supply and by wildlife. The dominant trees on this soil are Knobcone pine, Douglas fir, Chinkapin and madrone. The understory is mixed shrubs and herbs, including manzanita, rhododendron, evergreen huckleberry, tan oak, salal and beargrass.

Distribution and Extent: Occurs to a limited extent in southwestern Oregon within the region underlain by old volcanic members of the Dothan Formation.

521 SERIES

Taxonomic Class: Dystric Xerochrepts; loamy skeletal, mixed, mesic.

Typifying Pedon: Unit 521 gravelly loam
(colors are for moist soil unless otherwise noted)

A1 0-6"--Dark brown (7.5YR 4/4) gravelly loam, brown (7.5YR 5/4) dry; moderate very fine granular structure; slightly hard, friable, slightly sticky, slightly plastic; many fine and medium and few coarse roots; many fine tubular pores; 50 percent rock fragments; strongly acid (pH 5.5); clear wavy boundary; (4 to 8 inches thick).

B21 6-16"--Yellowish red (5YR 4/6) very gravelly silty clay loam, reddish yellow (7.5YR 6/6) dry; moderate very fine and fine granular and subangular blocky structure; slightly hard, friable, sticky, plastic; common fine and medium and few coarse roots; common fine and medium pores; 55 percent rock fragments; medium acid (pH 5.7); clear smooth boundary; (8 to 12 inches thick).

B22 16-29"--Yellowish red (5YR 4/8) gravelly heavy silty clay loam, reddish yellow (7.5YR 6/6) dry; moderate very fine, fine and medium subangular blocky structure; slightly hard; firm, sticky, very plastic; few fine and medium roots; few fine and medium pores; 25 percent rock fragments; medium acid (pH 5.8); clear smooth boundary. (10 to 15 inches thick).

R Hard, slightly fractured volcanic bedrock.

Type Location: SE 1/4 section 10, T. 39 S., R. 13 W. In cutbank of BLM road 39-14-15.0 (Bosley Butte Lookout Road)

Range in Characteristics: The soils are usually moist but are dry between 4 and 12 inches for more than 45 consecutive days in 6 out of 10 years within the 3 month period following the summer solstice. The mean summer temperature ranges from 47° to 55° F. The solum is 1 1/2 to 3 feet thick. Depth to bedrock is between 20 and 40 inches. Rock fragment content is between 15 and 50 percent in the A horizon and between 35 and 75 percent in the B horizon. The A horizon has a hue of 7.5YR or 5YR, value of 4 or 5 moist and dry and chroma of 3 or 4 moist and dry. The structure is moderately fine granular or subangular blocky. The reaction is strongly or very strongly acid. The texture is gravelly loam or gravelly light clay loam. The B horizon has a hue of 5YR or 7.5YR, value of 4 or 5 moist and 6 or 5 dray, and chroma of 6 or 8 moist and dry. The structure is moderate, very fine, fine, or medium subangular blocky. The reaction is medium or strongly acid. The texture is very gravelly loam or very gravelly light silty clay loam. The R horizon consists of slightly weathered and fractured old volcanic hard bedrock member of the Dothan Formation.

Competing Series and their Differential: These are the 505, 530, Digger, Unit 166, Straight, 520, Vena and Coyata soils. Unit 505 soils have 10YR hues in the A horizon and have formed in materials weathered from schists and schistose slate of the Colebrooke Schist Formation. Unit 530 soils have 10YR hues, values of 3 and chromas of 2 in the A horizon and hues of 10YR in the B horizon. Digger and Unit 166 soils have 10YR hues throughout the solum and have formed in materials weathered from Eocene sandstone. Straight soils have chromas of 5 or 6 dry and 3 or 4 moist in the A horizon and hues of 2.5YR, values of 3 or 4 moist and chromas of 3 or 4 moist and dry in the B horizon. The 520 soils have fine-loamy B horizons and are deep over a paralithic contact and strongly weathered old volcanic bedrock. Vena soils have 10YR hues in the A horizon. Coyata soils have umbric epipedons, and chromas of 3 or 4 moist and dry in the B horizon.

Setting: Unit 521 soils are on moderately steep to very steep buttes and ridges in mountainous uplands at elevations between 500 and 2800 feet. Slope gradients are generally between 35 and 80 percent. Unit 521 soils formed in colluvium and residuum weathered from old volcanic members of the Dothan Formation. Bedrock occurs at depths between 20

and 40 inches. The climate is a mild humid marine type with a mean annual precipitation of 60 to 120 inches and a dry summer period of at least 45 consecutive days in 6 years out of 10 during the 3 month period following the summer solstice. The mean annual temperature is about 52° F., the average January temperature is about 47° F., and the average July temperature is about 60° F. The frost free period is about 220 days.

Principal Associated Soils: These are the deep, red, fine-loamy Unit 520 soils from old volcanic rocks; the deep, red, clayey Dement soils from graywacke, the moderately deep, skeletal 530 soils from graywacke, the deep, brown, Pachic, fine-loamy Unit 524 soils from graywacke and with Rockland.

Drainage and Permeability: Well drained, medium to rapid runoff, moderately rapid permeability.

Use and Vegetation: Unit 521 soils are used for recreation, water supply and by wildlife. The dominant trees on this soil are knobcone pine, chinkapin and madrone. The understory is mixed shrubs such as manzanita, varnish leaf ceanothus, tan oak (dwarf) and canyon line oak.

Distribution and Extent: Occurs to a limited extent in southwestern Oregon within the region underlain by old volcanic members of the Dothan Formation.

Series Proposed: Curry County (Coos Bay District, BLM), Oregon 1974.

524 SERIES

Taxonomic Class: Pachic Haplumbrepts; fine-loamy, mixed, mesic.

Typifying Pedon: 524 gravelly loam - partial cut
(Colors are for moist soil unless otherwise noted)

O1 2-0"--Tan Oak leaves, twigs, Douglas Fir needles.

A1 0-10"--Dark brown (7.5YR 3/2) gravelly loam, grayish brown (10YR 5/2) dry; moderate very fine granular structure; soft, friable, nonsticky, nonplastic; common fine and medium roots; common fine tubular pores; 40 percent angular pebbles; very strongly acid (pH 4.8); clear smooth boundary. (6 to 12 inches thick).

A3 10-30"--Very dark grayish brown (10YR 4/3) dry; strong very fine granular structure; soft, friable, nonsticky, plastic; common fine and medium roots; common fine pores; 25 percent angular pebbles; very strongly acid (pH 4.9) abrupt smooth boundary. (15 to 25 inches thick).

B2 30-50"--Dark brown (7.5YR 4/4) gravelly silty clay loam, brown (7.5YR 5/4) dry; strong very fine granular and fine subangular blocky structure; slightly hard, friable, sticky, plastic; few fine and medium roots; common fine pores; 20 percent pebbles; strongly acid (pH 5.2) clear smooth boundary. (15 to 25 inches thick).

C1 50"+--Weathered, fractured graywacke sandstone (paralithic contact)

Type Location: Curry County, Oregon. SE 1/4, NE 1/4, section 19, T. 39 S., R. 13 W. In north cutbank of logging road.

Range in Characteristics: The soils are usually moist and are dry between depths of 4 and 12 inches for less than 45 consecutive days in 6 out of 10 years within the 3 month period following the summer solstice. The mean summer temperature ranges from 47 to 55° F. The solum is 4 to 6 feet thick. Depth to bedrock ranges from 5 to 7 feet. Coarse fragments are 15 or more percent throughout the solum and usually increase with depth. The 10 to 40 inch control section has less than 35 percent coarse fragments. The A horizon has a hue of 10YR or 7.5YR, value of 2 or 3, moist, and 4 or 5, dry, and chroma of 2 or 3, moist, and dry. It has moderate fine or very fine granular or very fine subangular blocky structure. It is very strongly or strongly acid and the thickness ranges from 24 to 30 inches. The B horizon has hue of 7.5YR or 10YR, value of 3 or 4 moist, 4 or 5 dry and chroma of 3 or 4 moist and dry. The texture is gravelly loam, gravelly silt loam, gravelly clay loam or gravelly silty clay loam. The structure ranges from moderate or strong, very fine to fine subangular blocky. The C1 horizon is semiconsolidated gray metasedimentary bedrock.

Competing Series and Their Differentiae: These are the Horeb, Hullt, Kinney, Preacher, Salal and Slickrock series. All of these except Salal and Slickrock soils have umbric epipedons less than 20 inches thick. Salal soils have less than 10 percent coarse fragments throughout and are strongly to medium acid throughout. They may contain pyroclastic materials or have amorphous properties. Slickrock soils formed in moderately fine textured colluvium weathered from arkosic sandstone.

Setting: These soils are on mountainous topography on uneven and dissected slopes of slump benches at elevations between 200 and 2800 feet. Slope gradients range from 10 to 60 percent. Unit 524 soils formed in moderately fine textured colluvium and residuum weathered from graywacke members of the Dothan Formation. Rock fragments are scattered throughout the material and bedrock occurs at depths greater than 4 feet. The climate is a mild, humid marine type with a mean annual precipitation of 60 to 120 inches. The mean annual temperature is about 52° F; the average January temperature is about 47° F; and the average July temperature is about 60° F. The frost-free period is about 220 days.

Principal Associated Soils: These are the deep, red, clayey Dement series, the moderately deep, loamy-skeletal Unit 530 soils from graywacke and the moderately deep, loamy-skeletal Unit 521 soils; and the deep, fine-loamy Unit 520 soils from old volcanic rocks.

Drainage and Permeability: Well drained; medium to rapid runoff; moderate permeability.

Use and Vegetation: Used for timber production, water supply, farming and by wildlife. The coniferous tree canopy is dominated by Douglas fir. The dominant hardwood is tanoak with a mixture of Pacific madrone. The understory is mixed shrubs and herbs. Swordfern is common.

Distribution and Extent: Slopes of the mountain ranges that make up the Klamath Mountain Province in southwestern Oregon. The series is of minor extent.

Series Proposed: Curry County (Coos Bay District, BLM), Oregon 1974.

530 SERIES

Taxonomic Class: Typic Xerumbrepts; loamy-skeletal, mixed, mesic.

Typifying Pedon: Unit 530 gravelly loam - Clearcut.
(colors are for moist soil unless otherwise noted)

O1 0-1"--Tan Oak, Chinkapin, Madrone and Douglas Fir leaves, needles and twigs.

A1 0-11"--Dark brown (7.5YR 3/2) gravelly loam, brown (10YR 5/3) dry; moderate very fine and fine granular structure; hard, friable, slightly sticky, slightly plastic; many fine and medium and few coarse roots; many fine tubular pores; 25 to 30 percent pebbles 2mm to 2 inches in diameter; very strongly acid (pH 4.8); clear smooth boundary. (8 to 14 inches thick).

B2 11-33"--Dark brown (10YR 4/3) very gravelly loam, pale brown (10YR 6/3) dry; weak to moderate very fine and fine granular and subangular blocky structure; hard, friable, slightly sticky, slightly plastic; common fine roots; many fine and medium tubular pores; 70 percent angular pebbles 1 to 2 inches in diameter; strongly acid (pH 5.5); clear smooth boundary. 12 to 30 inches thick.

C1 Weathered, fractured graywacke sandstone.

Type Location: NE 1/4, section 11, T. 39 S., R. 13 W. South cutbank of BLM Road 39-14-14.0 (Bosley Butte Road).

Range in Characteristics; The soils are usually moist but are dry between 4 and 12 inches for more than 45 consecutive days in 6 out of 10 years within the 3 month period following the summer solstice. The mean summer temperature ranges form 47 to 55°F. The solum is 2 to 3 1/2 feet thick. Depth to bedrock is 20 to 40 inches. Rock fragment content is between 15 and 50 percent in the A horizon and between 35 and 75 percent in the B horizon. The A horizon has a hue of 10YR or 7.5YR, value of 2 or 3 moist and 4 or 5 dry and chroma of 2 or 3 moist and dry. It has moderate fine or very fine granular or very fine subangular blocky structure. It is very strongly or strongly acid and the thickness ranges from 10 to 15 inches. The texture is gravelly loam or gravelly silt loam. The B horizon has a hue of 7.5YR or 10YR, value of 4 or 5 moist, 5 or 6 dry and chroma of 3 or 4 moist and dry. The texture is very gravelly loam or very gravelly light clay loam. The structure ranges from weak to moderate, very fine or fine granular or subangular blocky. The C1 horizon is weathered and fractured semiconsolidated graywacke sandstone of the Dothan Formation.

Competing Series and Their Differentiae: These are the Coyata, Washougal, 394, 505, 166 and Digger series. Digger, 394, 505 and 166 soils have ochric epipedons. Unit 166 and Washougal soils are deeper than 40 inches to bedrock and Washougal soils have coarse textures within the 10 to 40 inch control section. The Coyata and 505 soils have hues of 5YR in either the A or B horizon and chromas of 6 in the B horizons. Coyata soils formed mainly in colluvium weathered from basalt bedrock.

Setting: Unit 530 soils are on moderately steep or steep ridgetops and sideslopes in mountainous uplands at elevations of 200 to 2800 feet. Slope gradients range from 35 to 60 percent. Unit 530 soils formed in colluvium and residuum weathered from graywacke members of the Dothan Formation. Rock fragments are scattered throughout the material and bedrock occurs at depths less than 40 inches. The climate is a mild, humid marine type with a mean annual precipitation of 60 to 120 inches. The mean annual temperature is about 52°F.; the average January temperature is about 47°F.; and the average July temperature is about 60°F. The frost free period is about 220 days.

Principal Associated Soils: These are the deep, red clayey Dement soils from graywacke; the deep, dark brown, thick-surface layered, fine loamy Unit 524 soils from graywacke; the deep, red, fine-loamy Unit 520 soils from old volcanic rocks and the moderately deep, loamy-skeletal, red Unit 521 soils from old volcanic rocks.

Drainage and Permeability: Well drained; medium to rapid runoff; moderately rapid permeability.

Use and Vegetation: Unit 530 soils are used for timber production, water supply and by wildlife. The dominant trees on this soil are Douglas fir, tan oak, chinkapin and madrone. The understory is mixed shrubs and herbs, including manzanita, salal, evergreen huckleberry and beargrass.

Distribution and Extent: Occurs to minor extent in southwestern Oregon within the region underlain by graywacke bedrock of the Dothan Formation.

Series Proposed: Curry County (Coos Bay District, BLM), Oregon 1974.

(540) DEMENT SERIES

Taxonomic Class: Umbric Dystrochrepts; fine, mixed, mesic.

Typifying Pedon: Dement silt loam - mixed forest.
(Colors are for moist soil unless otherwise noted).

A1 0-7"--Very dark grayish brown (10YR 3/2) silt loam, brown (10YR 5/2) dry; moderate fine and medium granular structure; slightly hard, friable, slightly sticky, slightly plastic; common very fine to medium roots; many very fine pores; slightly acid (pH 6.2); abrupt smooth boundary. (6 to 10 inches thick)

B21 7-23"--Reddish brown (5YR 4/3) heavy silty clay loam, brown (7.5YR 5/4) dry; moderate fine and medium subangular blocky sturcture; very hard, firm, sticky, plastic; common very fine to medium roots; many very fine to medium pores; common thin reddish brown (5YR 4/4) exped coatings; very strongly acid (pH 5.0); clear smooth boundary. (14 to 20 inches thick).

B22 23-36"--Reddish brown (5YR 5/4) heavy silty clay loam, brown (7.5YR 5/4) dry; weak medium subangular blocky structure; very hard, firm, sticky, plastic; common fine to medium roots; common very fine and fine pores; few thin reddish brown (5YR 4/4) exped coatings; strongly acid (pH 5.4); clear smooth boundary. (10 to 15 inches thick).

B3 36-45"--Reddish brown (5YR 4/4) heavy silt loam, brown (7.5YR 4/4) dry; weak coarse subangular blocky structure; hard, friable, slightly sticky, slightly plastic; common fine and medium roots; few very fine pores; very few thin reddish brown (5YR 4/4) exped coatings; strongly acid (pH 5.4); clear smooth boundary. (6 to 10 inches thick).

C 45-72"--Variegated weathered sedimentary bedrock with common fine and medium red (2.5YR 5.6) iron stains along fracture planes of upper part.

Type Location: Coos County, Oregon. 200' north, 300' west of S 1/4 corner, section 30, T. 27 S., R. 12 W., north side of the Coquille-Fairview Road.

(557) ETELKA SERIES

Taxonomic Class: Typic Dystrochrepts; fine, mixed, mesic.

Typifying Pedon: Etelka silt loam - forested regrowth after clearcut. (Colors are for moist soil unless otherwise noted).

A1 0-13"--Dark grayish-brown (2.5Y 4/2) silt loam, light brownish gray (2.5Y 6/2) when dry; moderate, fine and medium, granular structure; slightly hard, very friable, slightly sticky and slightly plastic; many, very fine to medium roots; many, very fine and fine, tubular and interstitial pores; about 2 percent coarse fragments; strongly acid (pH 5.4); clear, wavy boundary. (8 to 14 inches thick.)

B1 13-24"--Dark brown (10YR 4/3) heavy silt loam, brown and pale brown (10YR 5/3, 6/3) when dry, moderate, fine, subangular blocky structure; hard, friable, slightly sticky and slightly plastic; many, very fine to medium roots; many very fine and fine, tubular and interstitial pores; about 4 percent coarse fragments; strongly acid (pH 5.2); gradual, smooth boundary. (9 to 12 inches thick.)

B21 24-32"--Olive brown (2.5Y 4/4) silty clay loam, light olive brown (2.5Y 5/4) when dry; moderate, medium, subangular blocky structure; very hard, friable, sticky and plastic; many, fine and medium roots; common very fine and fine, tubular and interstitial pores; about 6 percent coarse fragments; few, fine, faint mottles below 28 inches; strongly acid (pH 5.4); gradual, smooth boundary. (6 to 10 inches thick.)

B22 32-45"--Olive brown and dark grayish-brown (2.5Y 4/4, 4/2) silty clay, light olive brown and light brownish gray (2.5Y 5/4, 6/2) when dry, with common, fine, distinct, yellowish-brown (10YR 5/8) mottles; moderate, coarse, subangular blocky structure; extremely hard, firm, very sticky and very plastic; common fine and medium roots; common very fine and fine, interstitial pores; about 8 percent coarse fragments; strongly acid (pH 5.4); clear, wavy boundary. (8 to 15 inches thick.)

B3 45-60"--Olive brown and dark grayish-brown (2.5Y 4/4, 4/2) silty clay, light olive brown and light brownish gray (2.5Y 5/4, 6/2) when dry, with many, medium, distinct, yellowish-brown, gray, and strong brown (10YR 5/8, 6/1, 7.5YR 5/6) mottles; moderate, coarse, subangular blocky structure; extremely hard, firm, very sticky and very plastic; few, very fine to medium roots; few, very fine and fine, interstitial pores; medium acid (pH 5.6). (7 to 20 inches thick.)

Type Location: Coos County, Oregon. About 1500 feet north, 2500 feet west of the SE corner of section 17, T. 31 S., R. 12 W., W.M. (In SW 1/4 NW 1/4 SE 1/4); approximately 6 miles west of Powers, Oregon, in the west side road cut of BLM road, south of the Baker quarry.

(564) UMPCOOS SERIES

Taxonomic Class: Lithic Dystrochrepts; loamy-skeletal, mixed, mesic.

Typifying Pedon: Umpcoos very gravelly sandy loam - forested.
(Colors are for moist soil unless otherwise noted.)

O1 2-0"--Litter of leaves, twigs, roots, and partially decomposed materials; abrupt, wavy boundary.

A1 0-3"--Dark grayish-brown (10YR 4/2) very gravelly sandy loam, pale brown (10YR 6/3) when dry; moderate, fine and medium, granular structure; soft, very friable, nonsticky and nonplastic; many, very fine to medium roots; many, very fine to medium, tubular and interstitial pores; about 50 percent pebbles; medium acid (pH 5.8, CPR); clear, smooth boundary.

B 3-16"--Brown (10YR 4/3) very gravelly sandy loam, pale brown (10YR 6/3) when dry; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; many, very fine to medium roots; many very fine to medium tubular and interstitial pores; about 40 percent pebbles, 20 percent cobbles; medium acid (pH 5.6); abrupt, wavy boundary.

R 16" at contact of hard sandstone of Tyee Formation.

Type Location: Coos County, Oregon; about 8 miles due east of Fairview on the north side of Burnt Mountain Access Road, south of the Middle Creek Road; about 1600 feet south, 1000 feet west of the NE corner of section 17, T. 27 S., R. 10 W.

(580) EDSON SERIES

Taxonomic Class: Typic Haplohumults; clayey, mixed, mesic.

Typifying Pedon: Edson clay loam - forested
(Colors are for moist soil unless otherwise noted.)

A1 0-6"--Reddish brown (5YR 4/4) clay loam, yellowish red (5YR 5/6) dry; moderate medium subangular blocky structure; hard, friable, sticky, plastic; many roots; many very fine pores; strongly acid (pH 5.2); clear smooth boundary. (4 to 8 inches thick).

B21t 6-20"--Reddish brown (5YR 4/4) silty clay, yellowish red (5YR 5/6) dry; moderate medium subangular blocky structure; hard, firm, sticky, very plastic; many roots; many very fine and fine pores; few thin and moderately thick clay films in tubular pores and on faces of peds; very strongly acid (pH 5.0); diffuse smooth boundary. (8 to 20 inches thick)

B22t 20-36"--Reddish brown (5YR 4/4) silty clay, yellowish red (5YR 5/6) dry; weak medium subangular blocky structure; hard, firm, sticky, very plastic; many roots; many very fine and fine pores; few thin and moderately thick clay films in tubular pores and on faces of peds; strongly acid (pH 5.1); diffuse smooth boundary. (10 to 20 inches thick).

B23t 36-46"--Reddish brown (5YR 4/4) silty clay, yellowish red (5YR 5/6) dry; weak medium and coarse subangular blocky structure; hard, firm, sticky, very plastic; many roots; few very fine and medium pores and common fine and medium pores; few thin and moderately thick clay films in tubular pores and on faces of peds; strongly acid (pH 5.1); diffuse smooth boundary. (8 to 14 inches thick).

B3t 46-60"--Yellowish red (5YR 4/6) silty clay loam, yellowish red (5YR 5/6) dry; weak medium subangular blocky structure; hard, firm, sticky, plastic; few roots; few very fine to medium pores; common thin clay films in pores; strongly acid (pH 5.1); clear irregular boundary. (6 to 20 inches thick).

C 60-72"--Yellowish brown (10YR 5/6) silty clay loam, yellow (10YR 7/6) dry; massive; hard, firm, sticky, plastic; few roots; few very fine to medium pores; common thin clay films in pores; very strongly acid (pH 5.0).

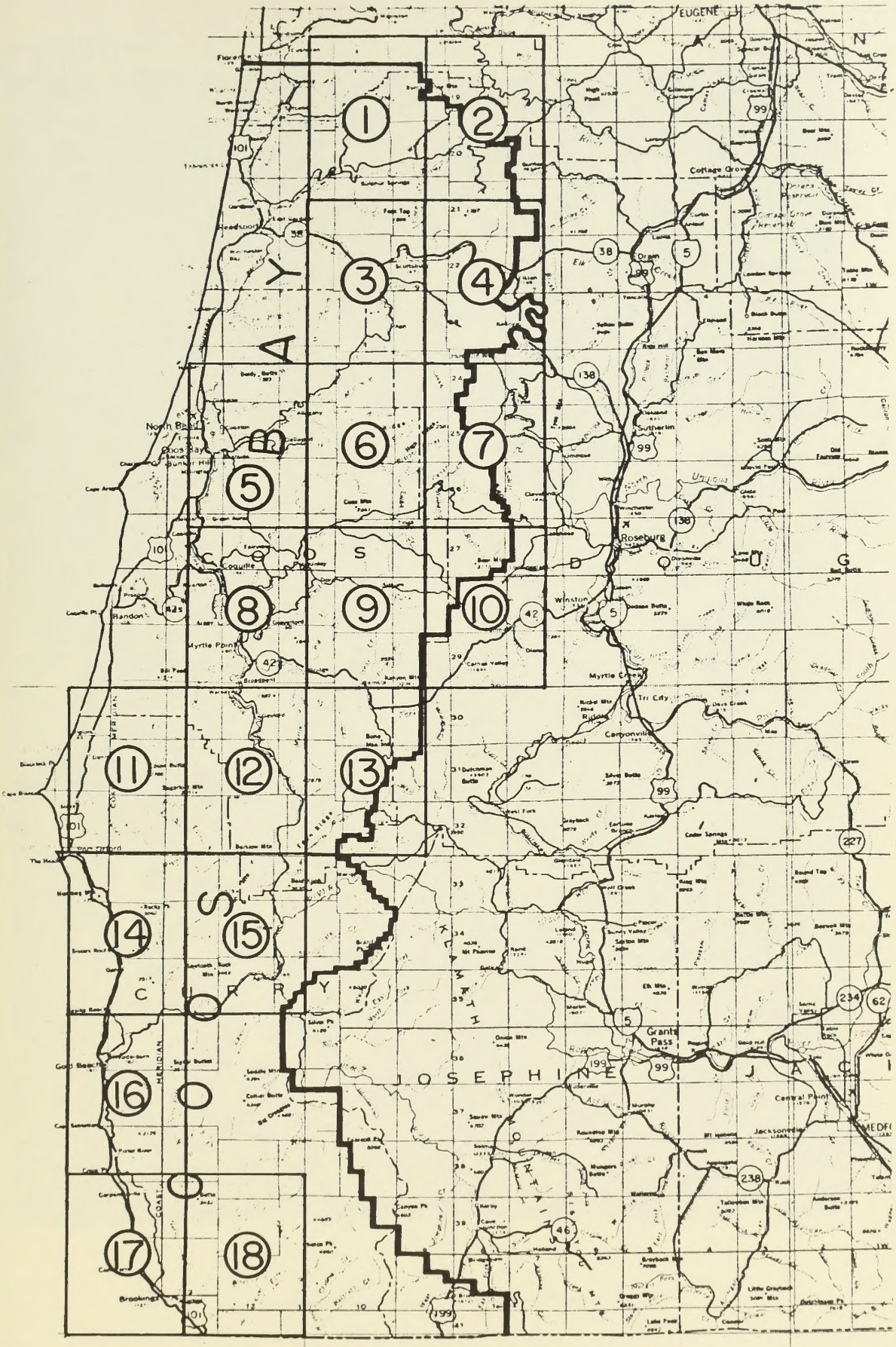
Type Location: Curry County, Oregon; approximately 1,320 feet north of the S 1/4 corner of section 35, T. 34 S., R. 14 W.; about 3 1/2 miles NE of Ophir along Euchre Creek.

TABLE 18 LEGEND FOR SOIL INVENTORY MAP SHEETS

Soil Symbol	Soil Name	Soil Symbol	Soil Name
1	Alluvial Land	501	Whobrey Series
10	Blachly Series	503	Unit 503 Series
12	Jory Series	505	Unit 505 Series
14	Honeygrove Series	520	Unit 520 Series
50	Apt Series	521	Unit 521 Series
54	Slickrock Series	524	Unit 524 Series
57	Preacher Series	530	Unit 530 Series
57B	Preacher Series, Bouldery	540	Dement Series
63	Bohannon Series	557	Etelka Series
64	Jason Series	564	Unit 564 Series
66	Digger Series	580	Edson Series
166	Unit 166 Series	R	Rock land

Slope Gradient Classes

Slope Symbol	Gradient (percent)
V	0-10
W	10-35
X	35-60
Y	60-80
Z	80+



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GOODWIN PEAK QUADRANGLE
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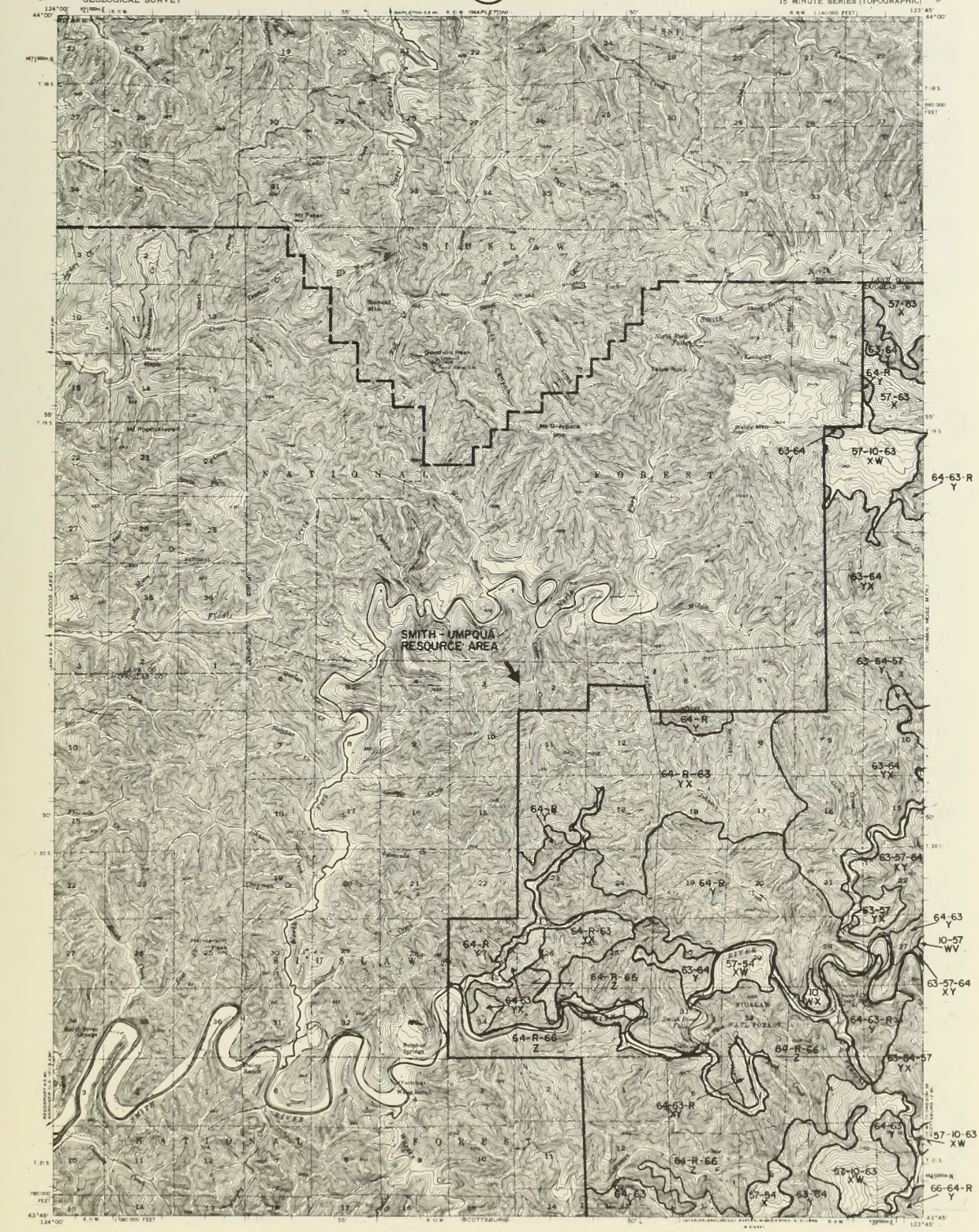

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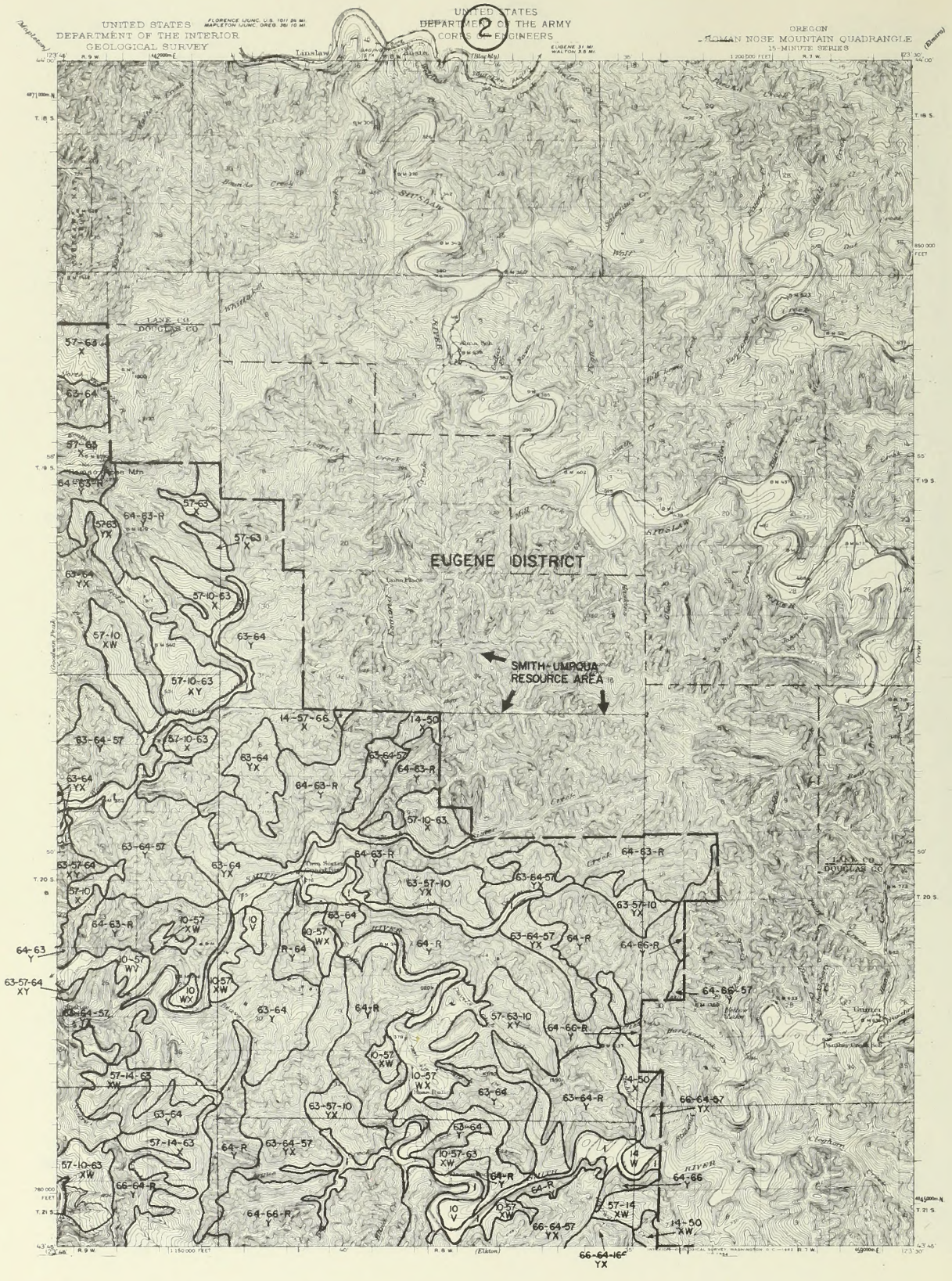

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SCOTTSBURG QUADRANGLE
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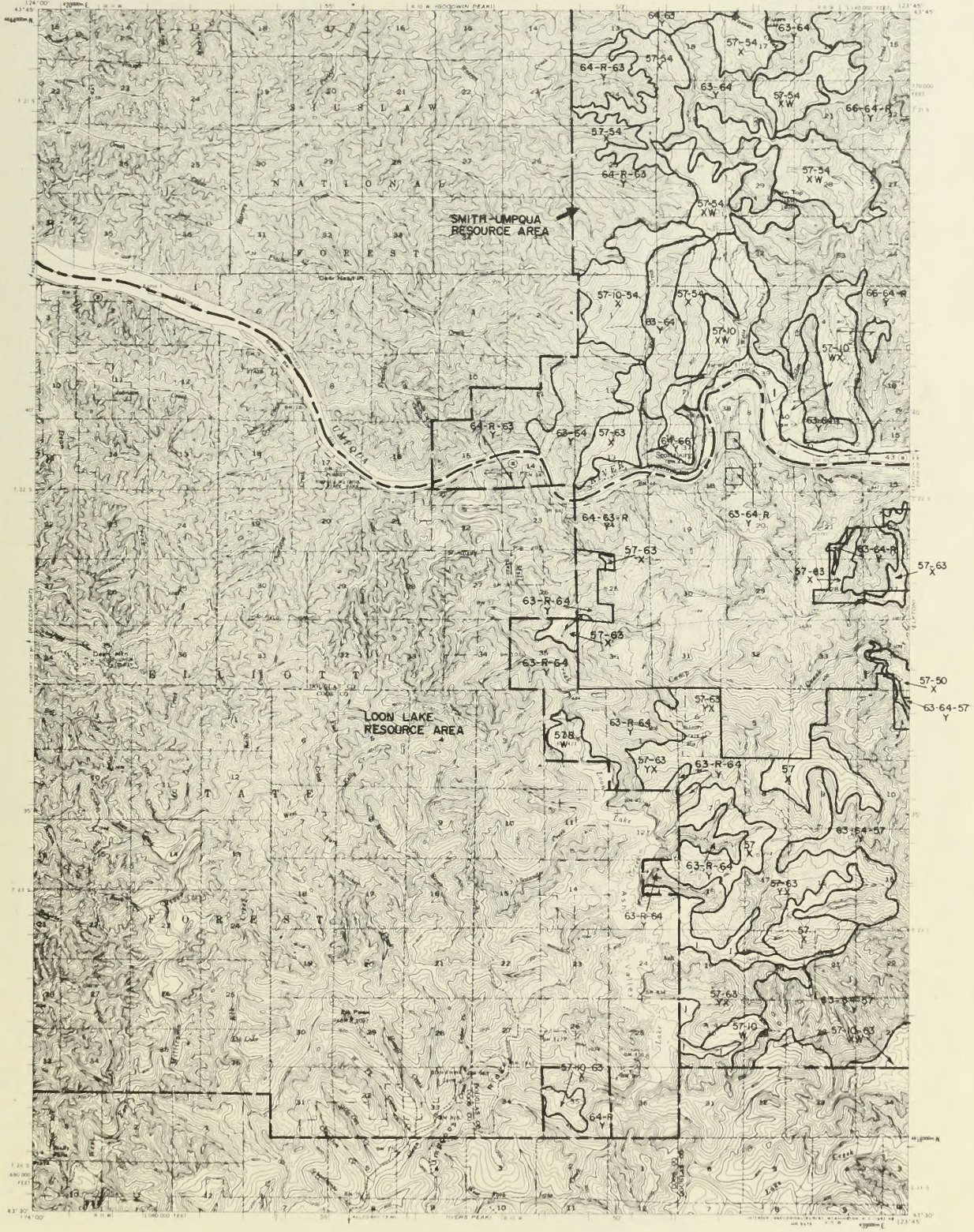

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ELKTON QUADRANGLE
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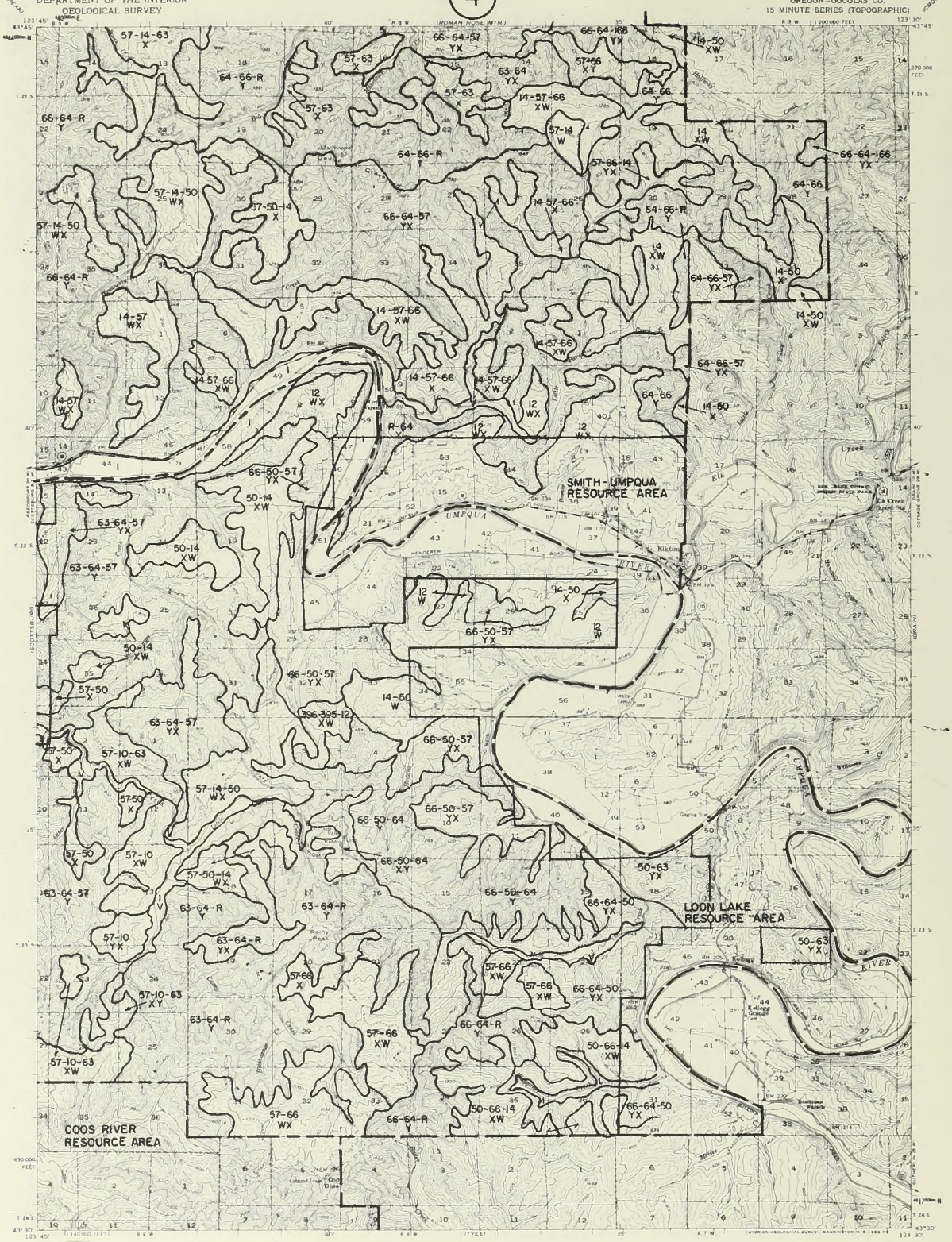

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OREGON
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COOS BAY QUADRANGLE
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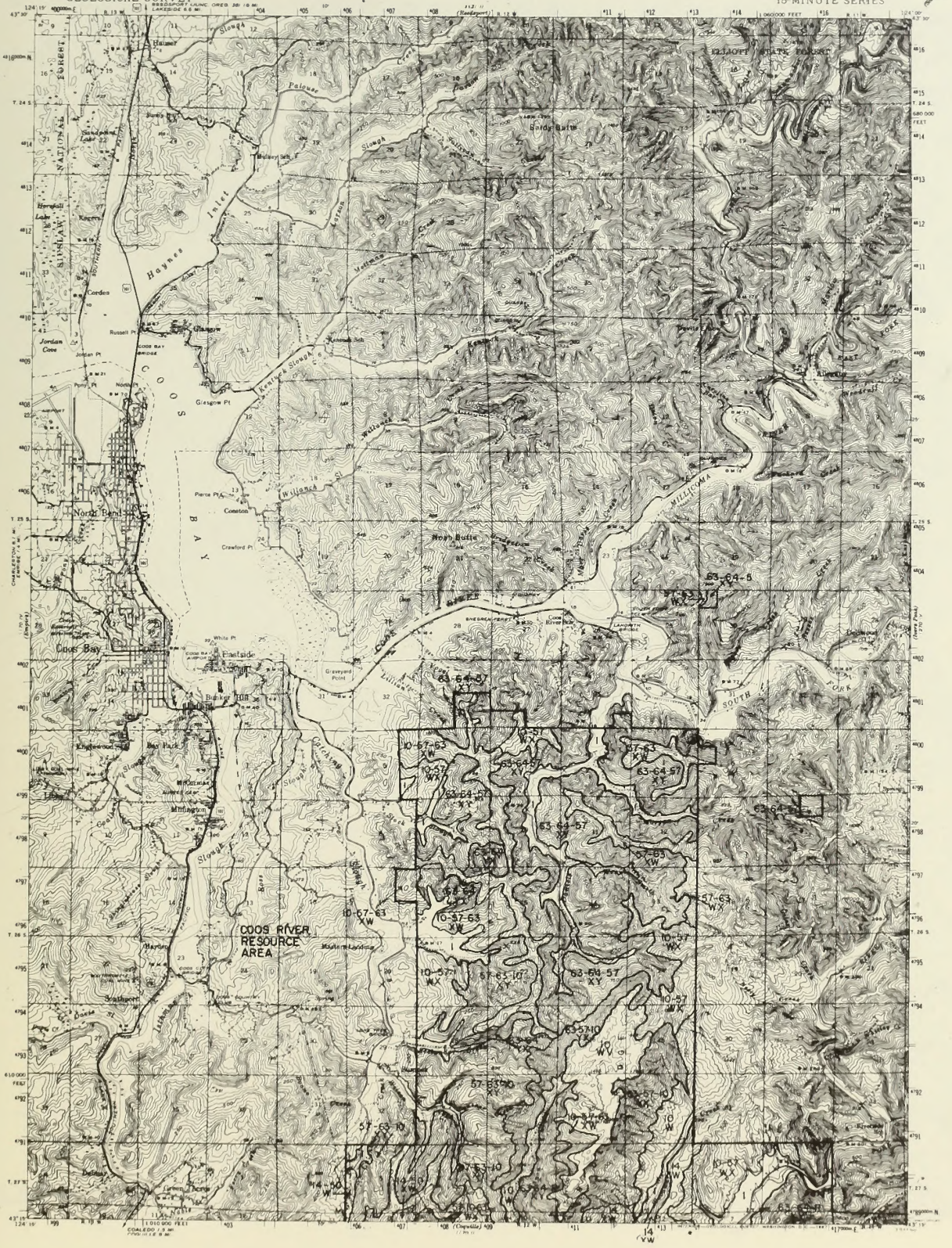

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IVERS PEAK QUADRANGLE
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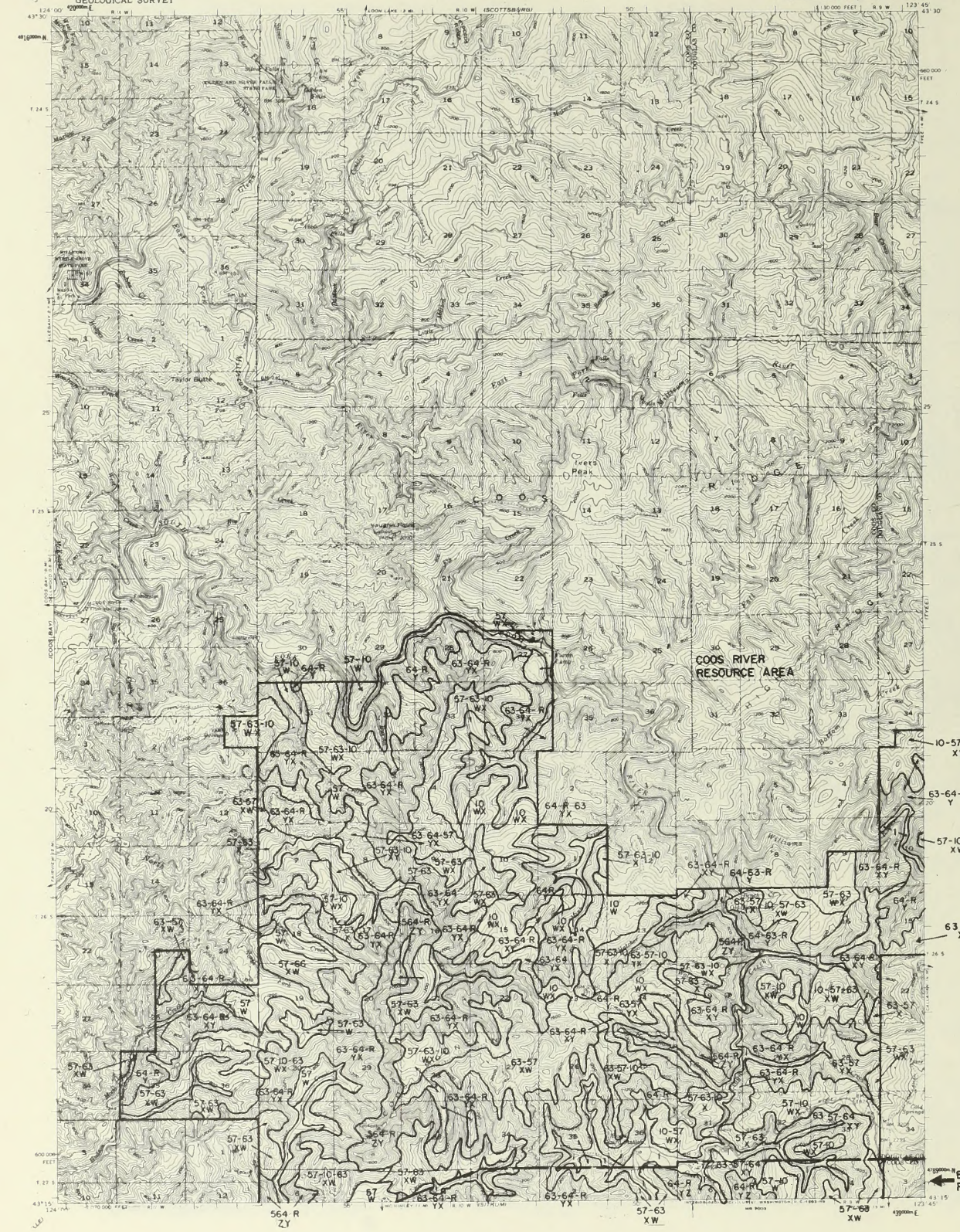

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TYEE QUADRANGLE
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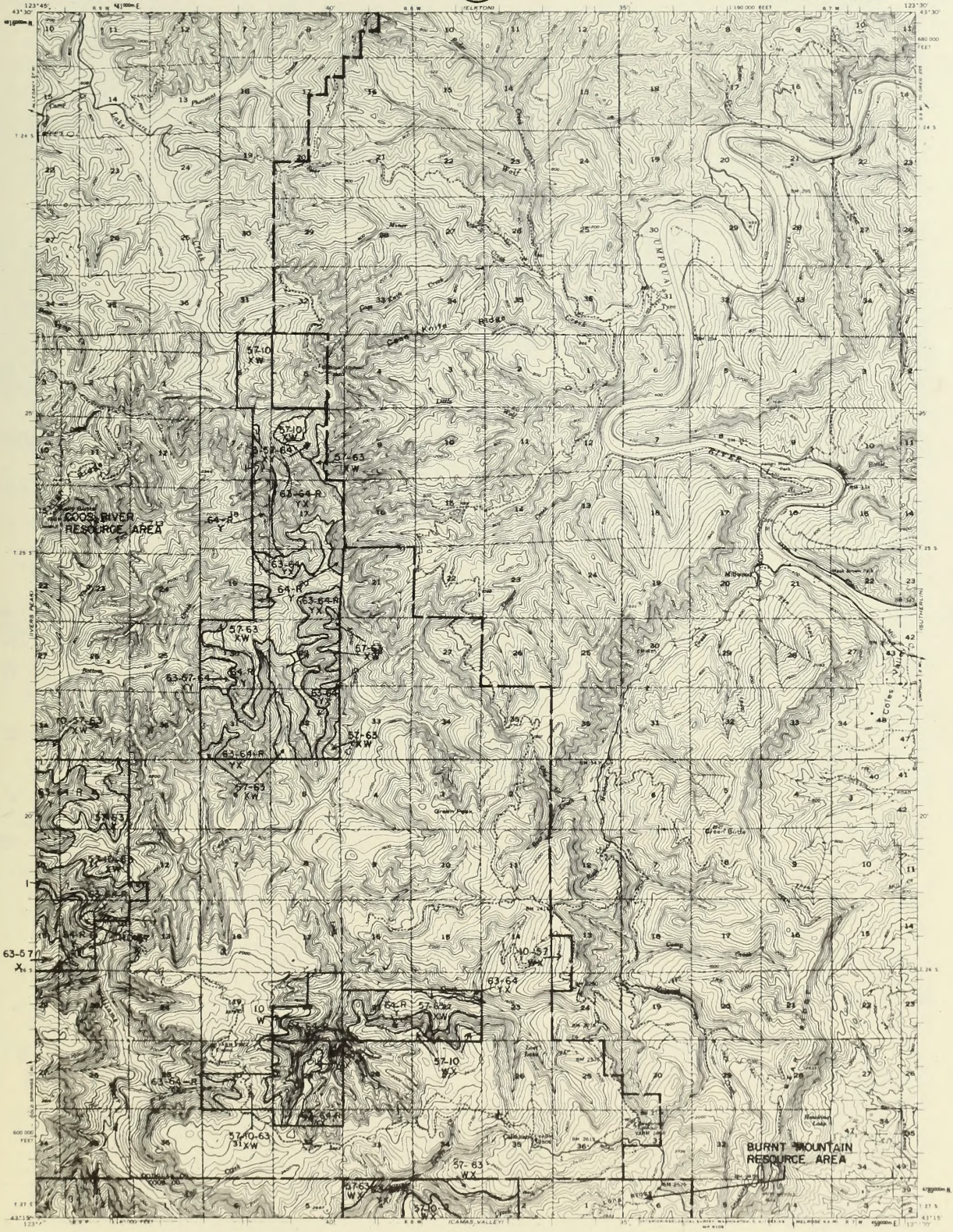

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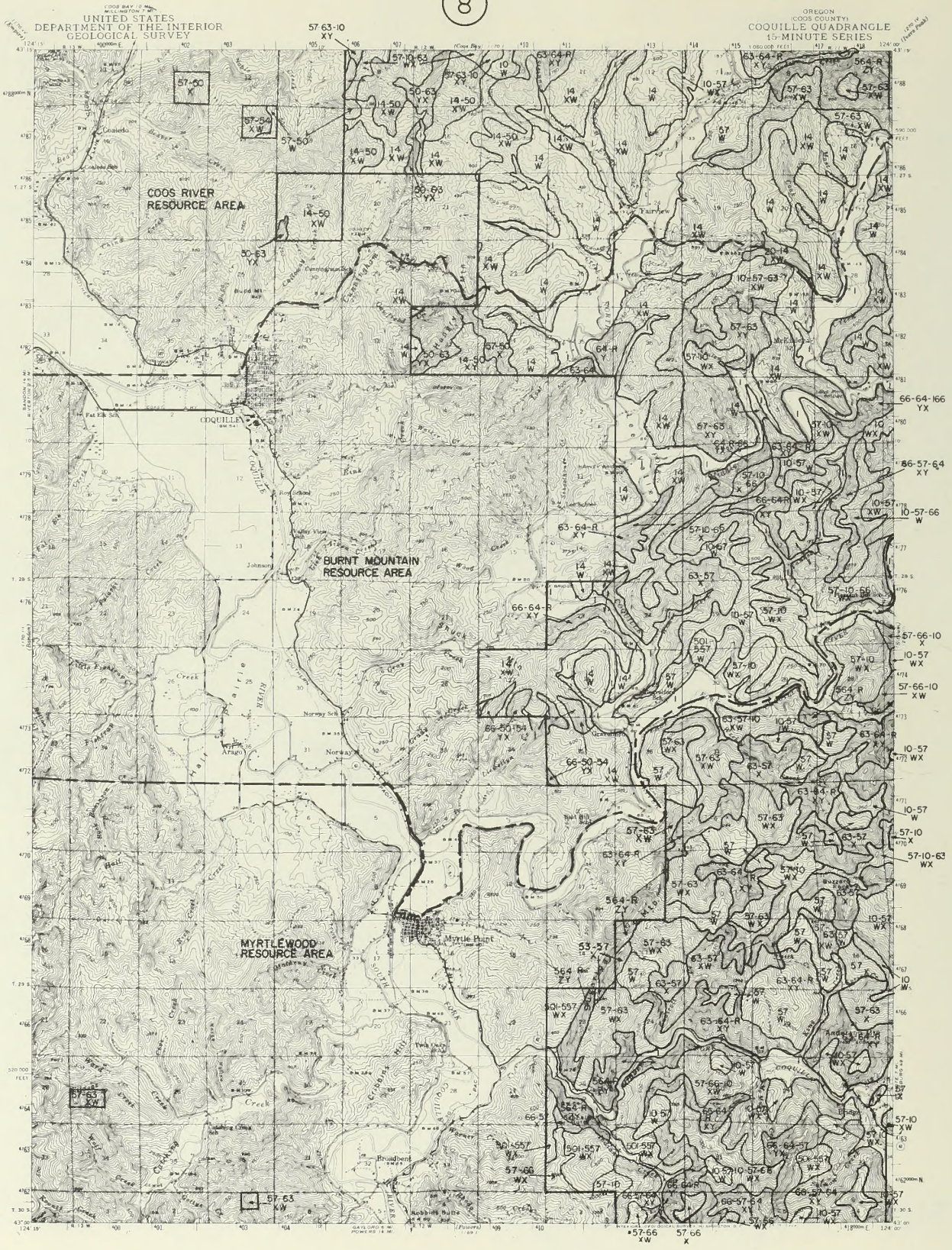

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SITKUM QUADRANGLE
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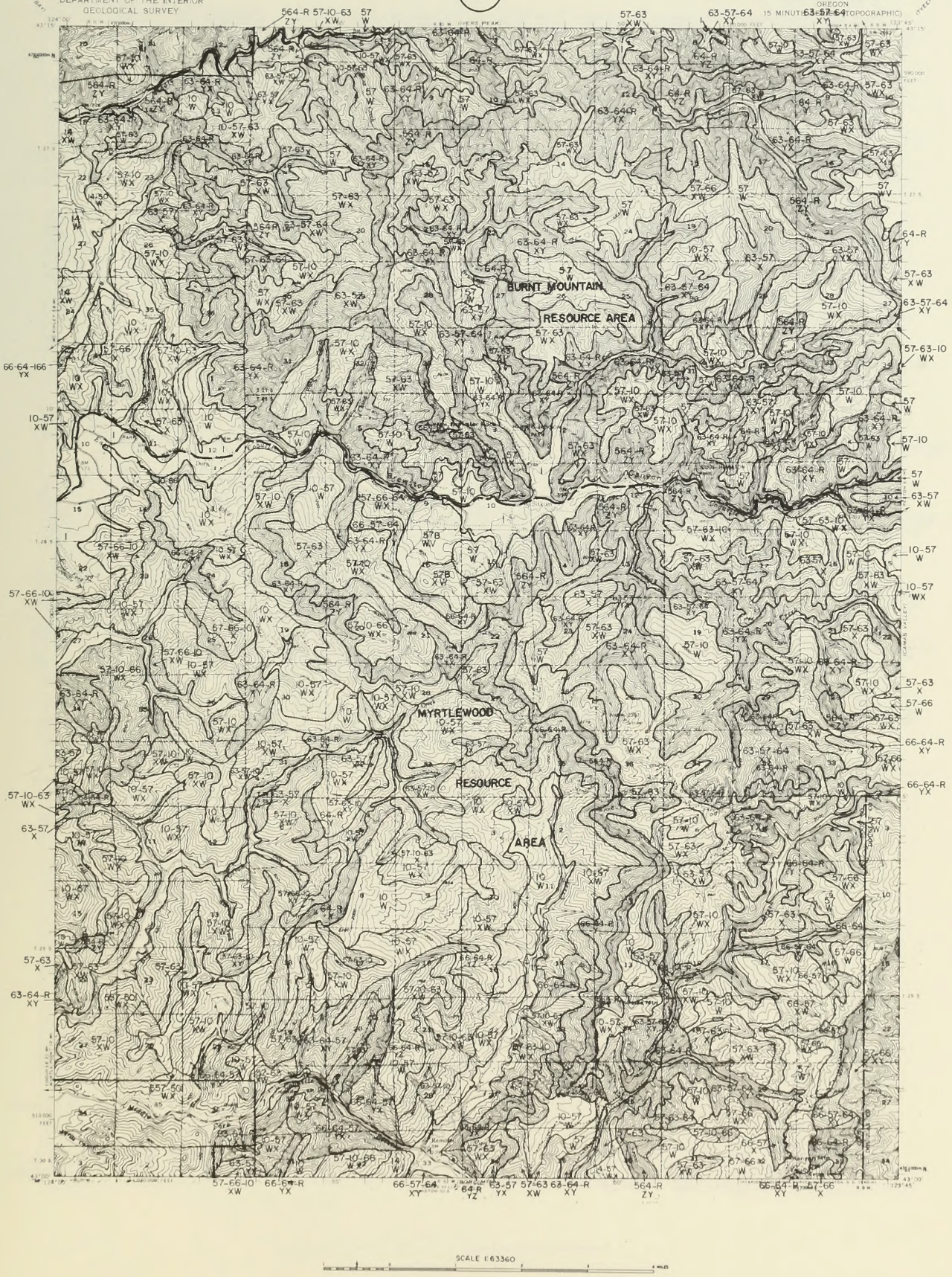

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CAMAS VALLEY QUADRANGLE
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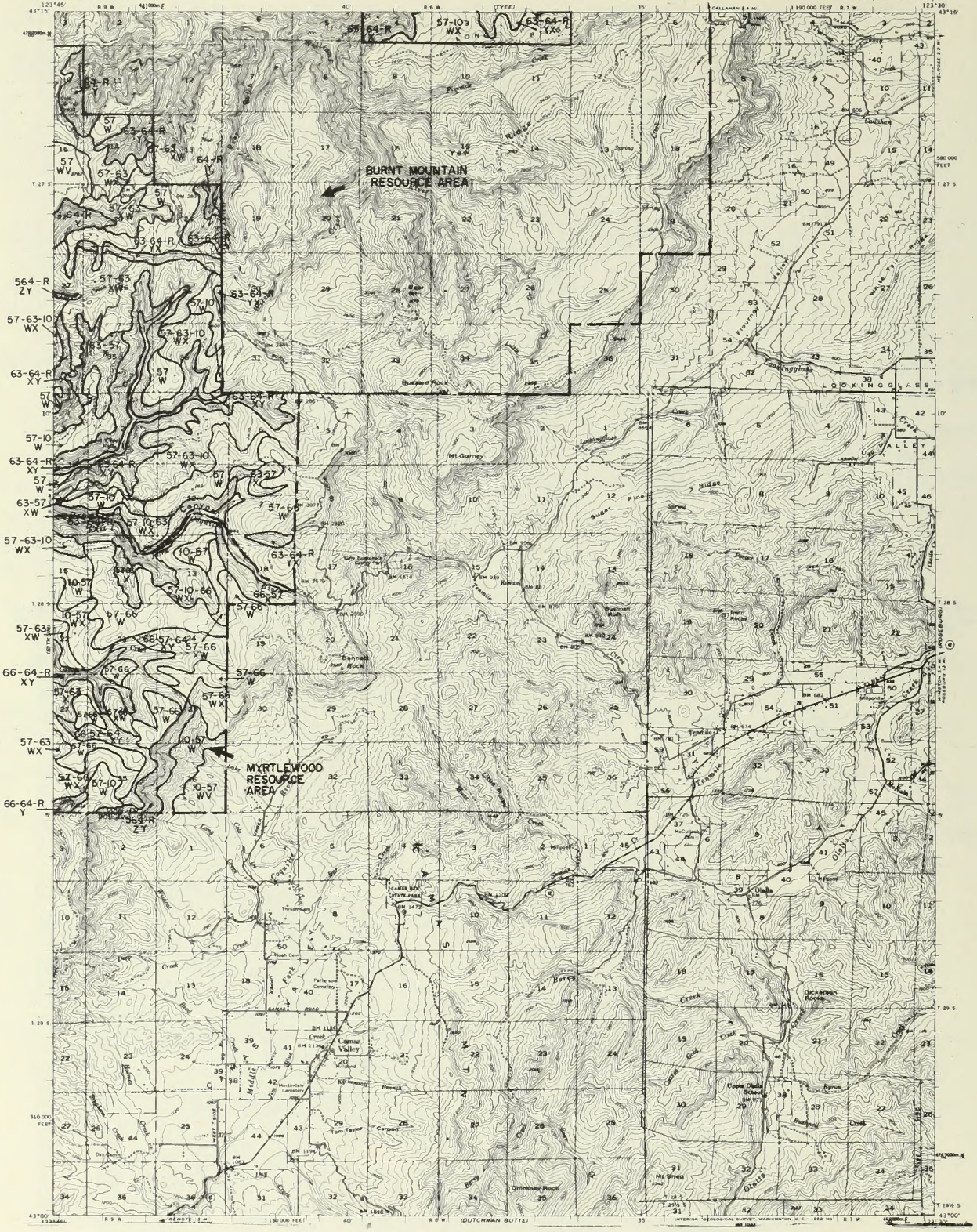

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LANGLOIS QUADRANGLE
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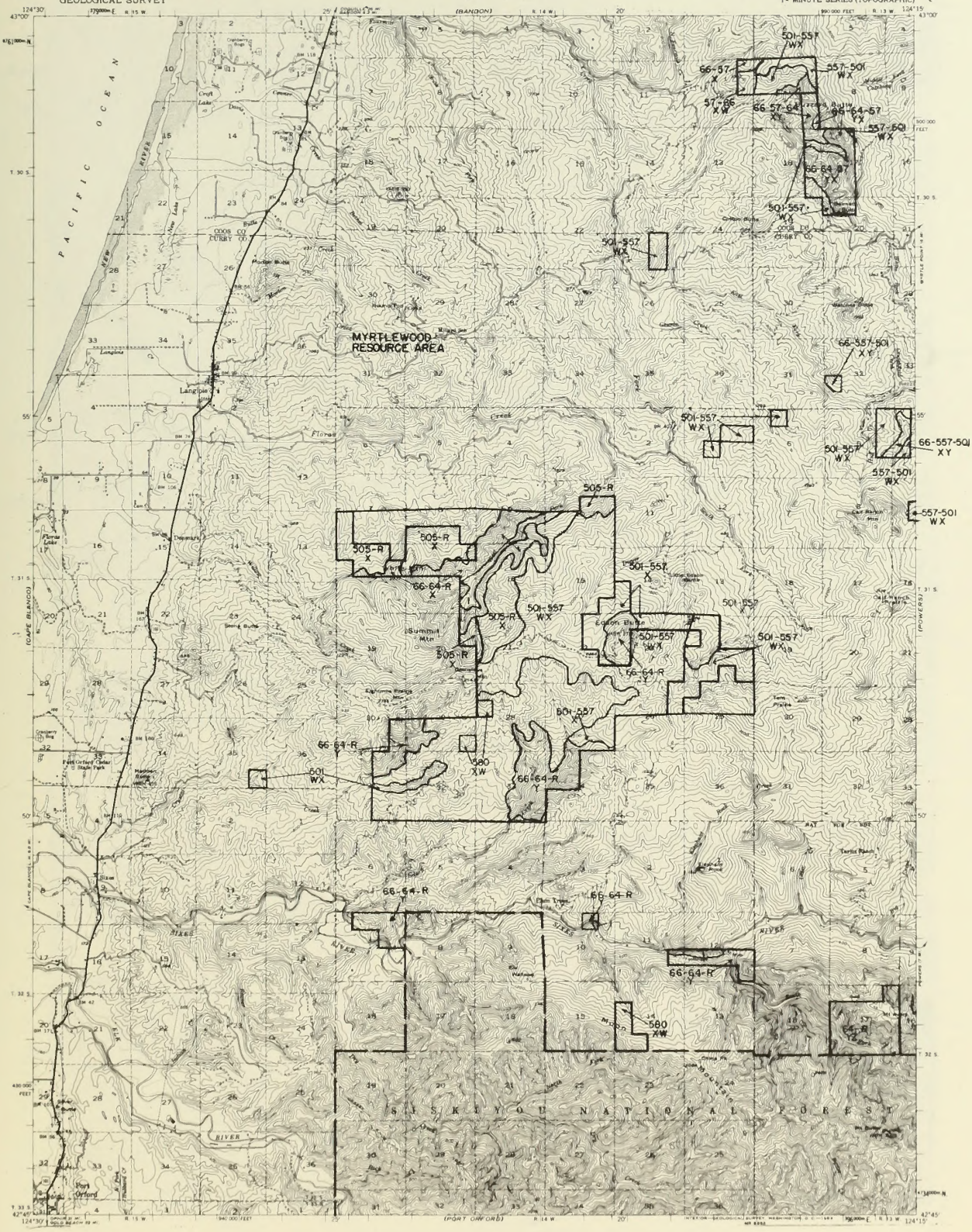

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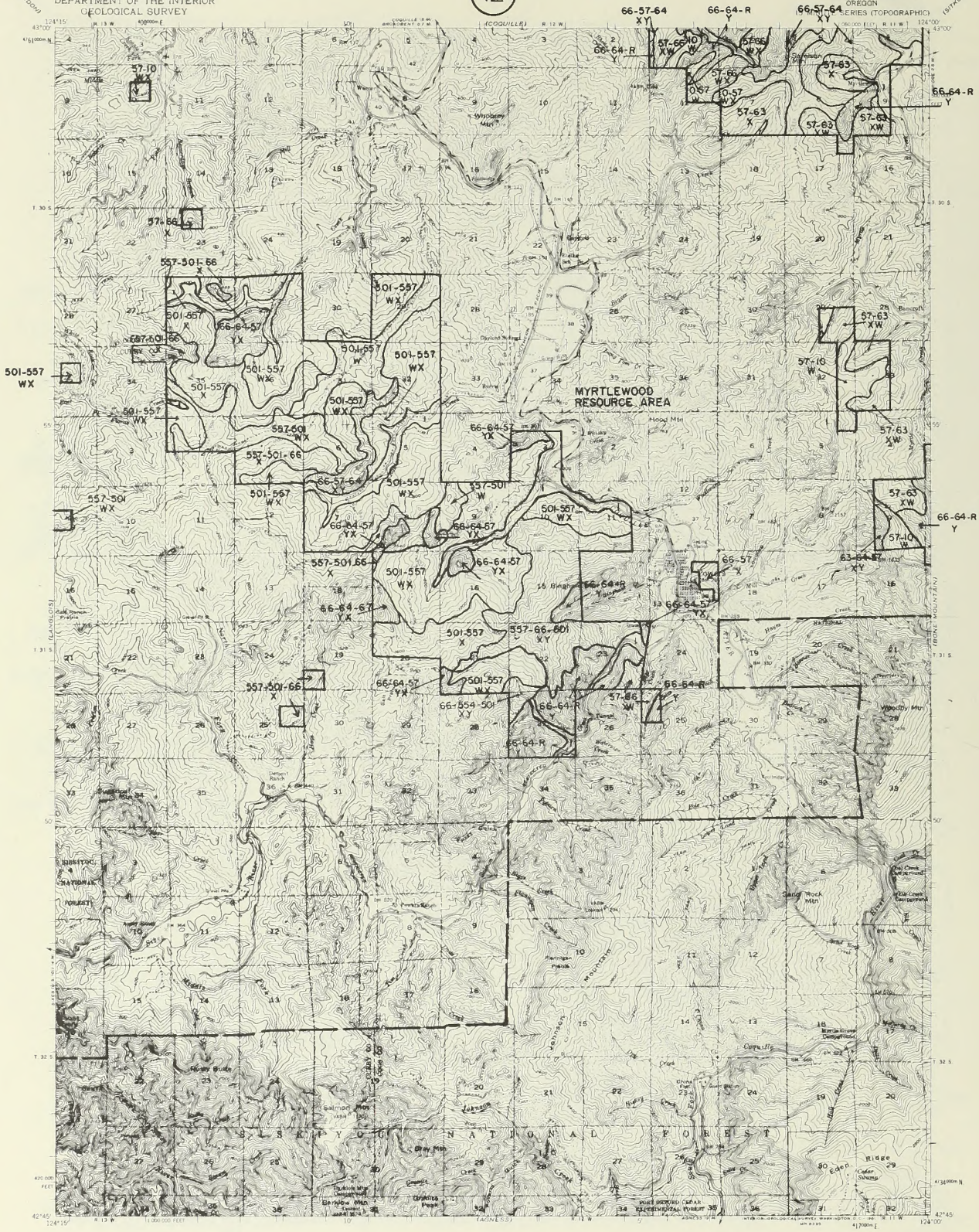

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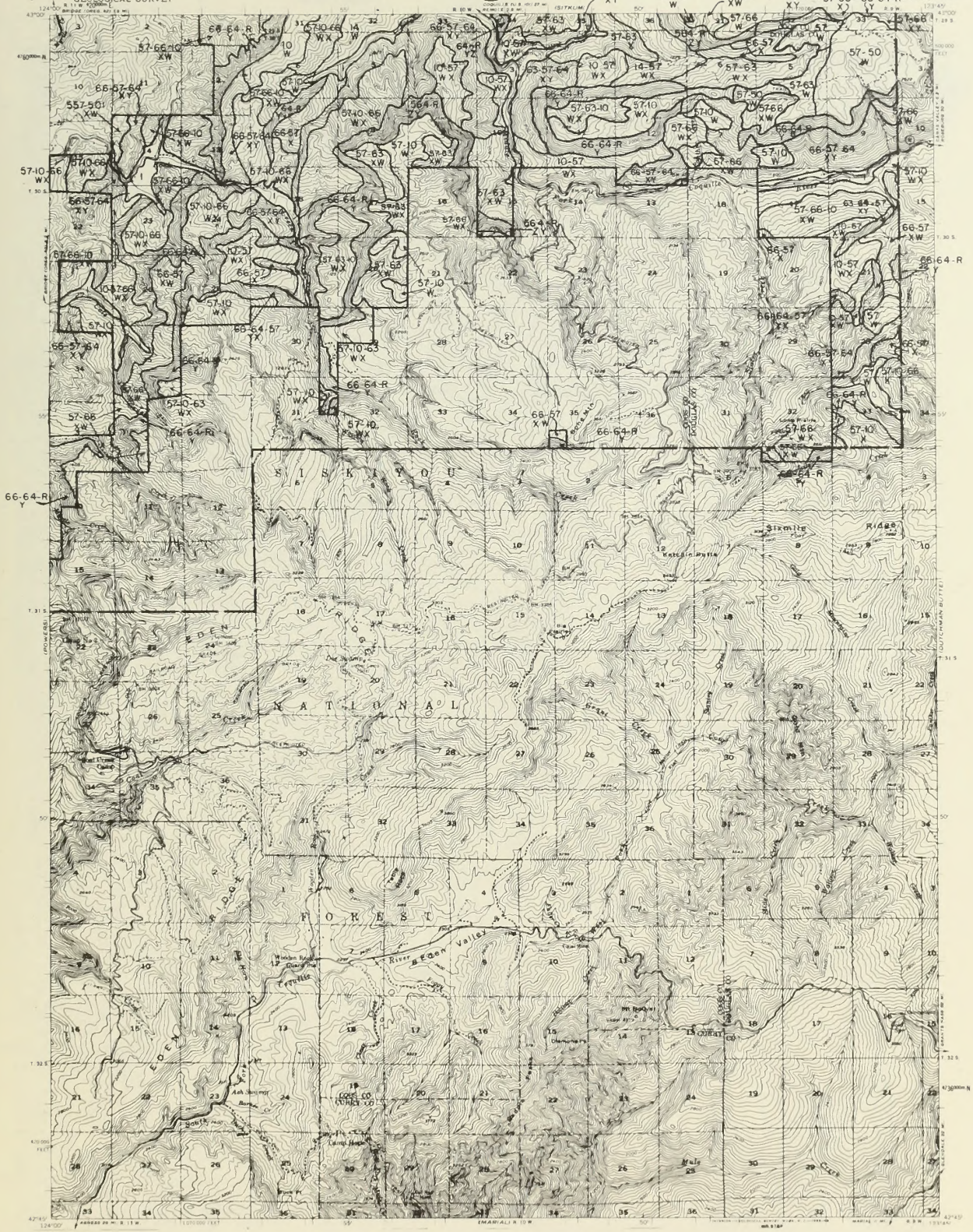
BONE MOUNTAIN QUADRANGLE
OREGON



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PORT ORFORD QUADRANGLE
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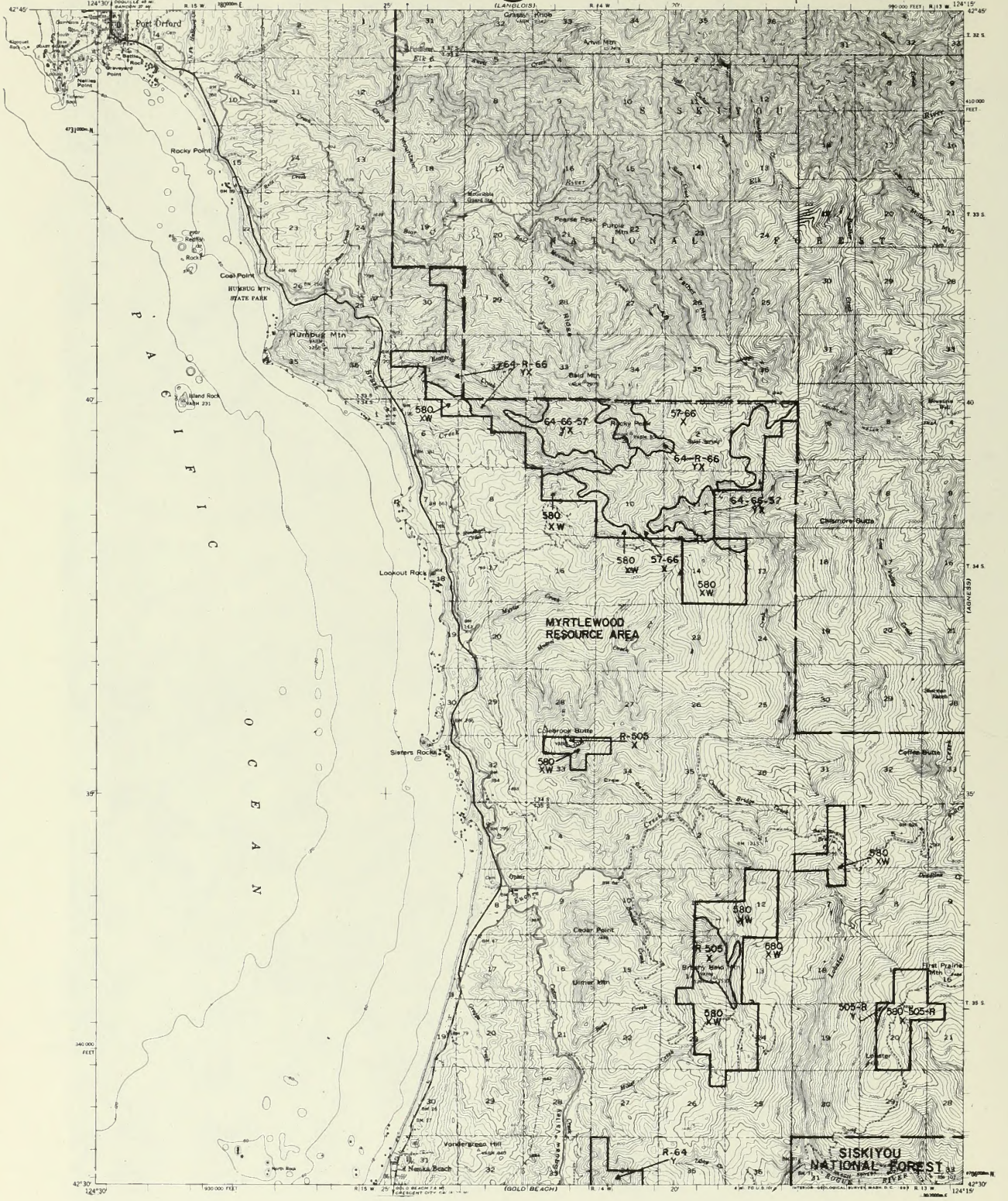

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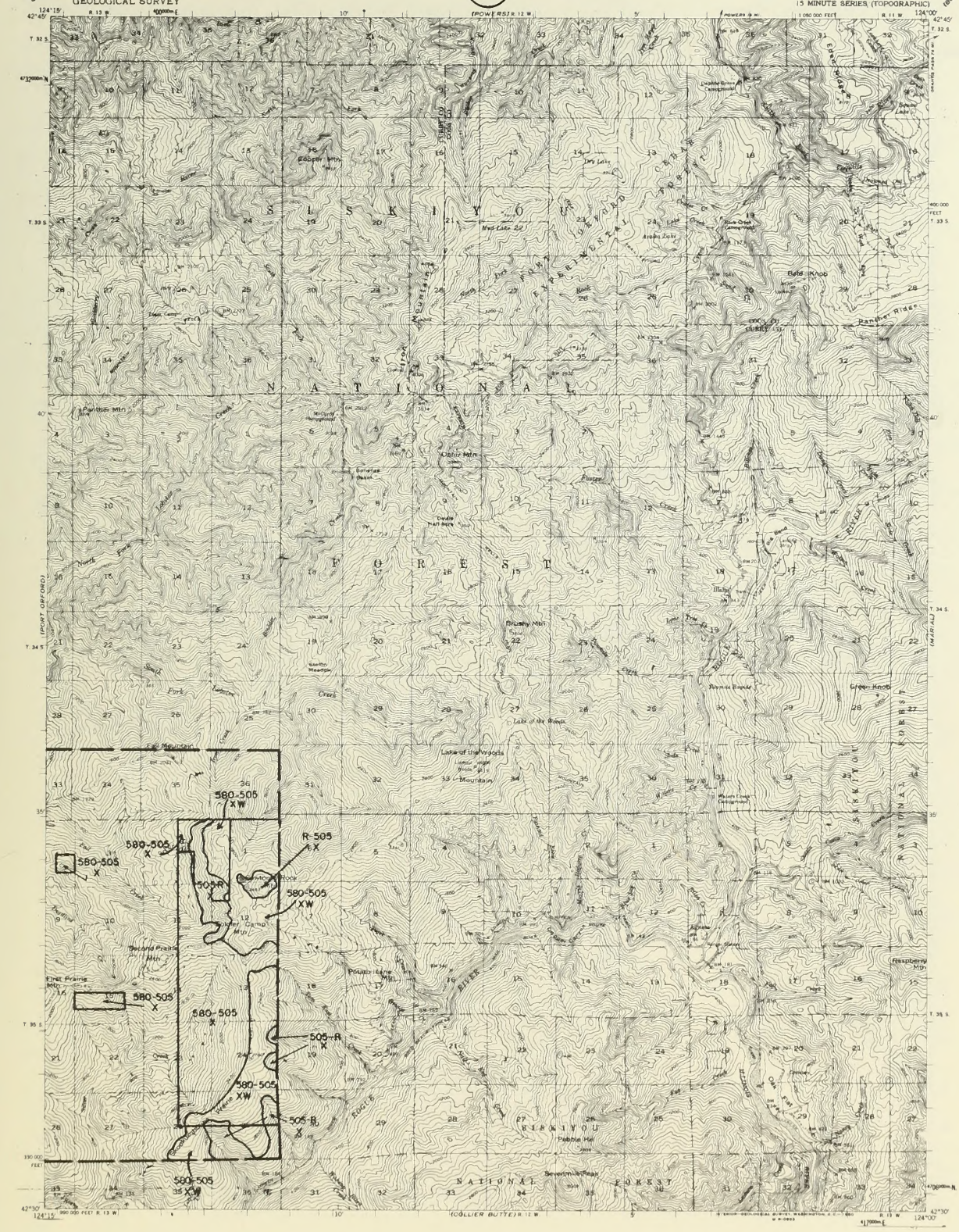

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GOLD BEACH QUADRANGLE
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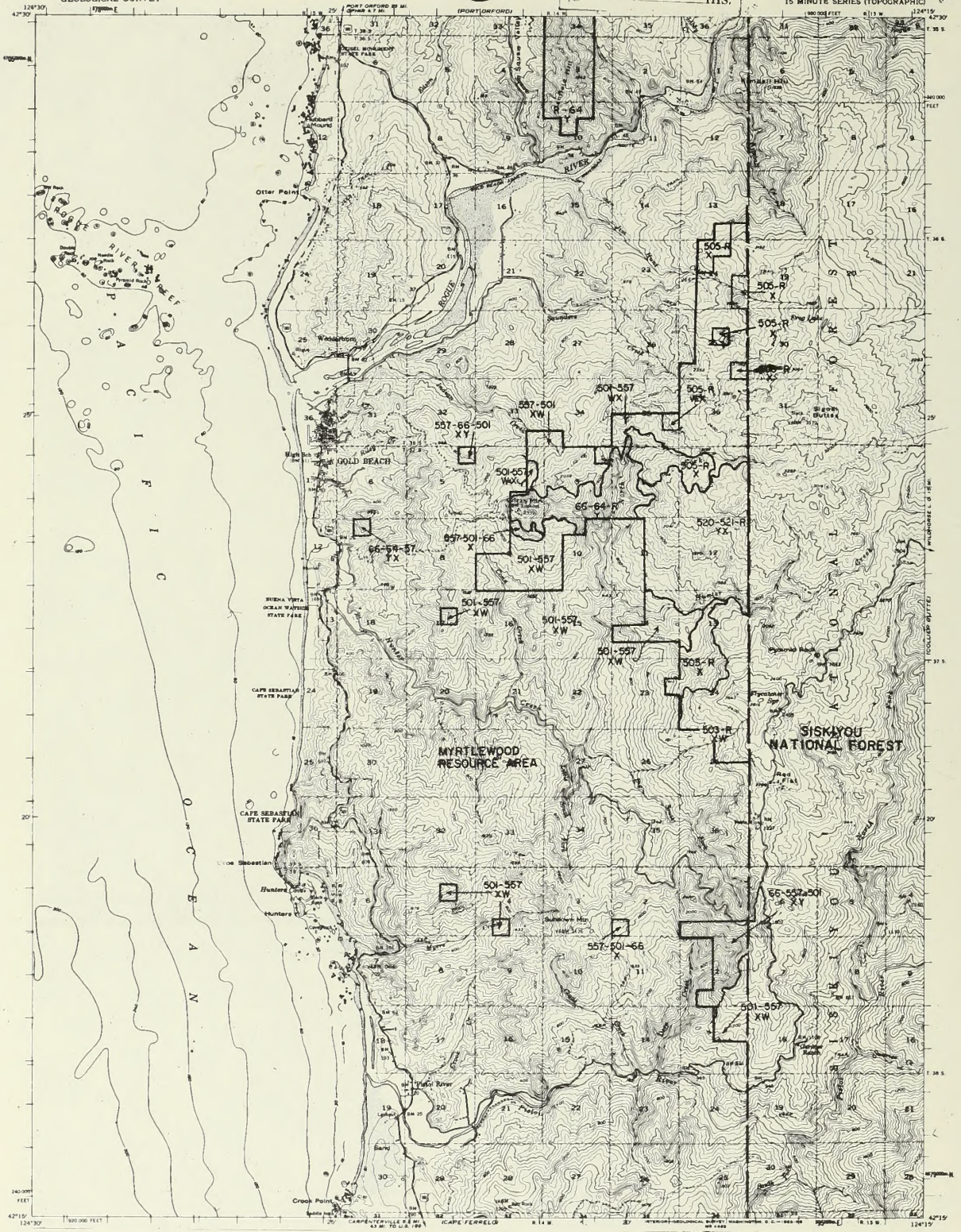

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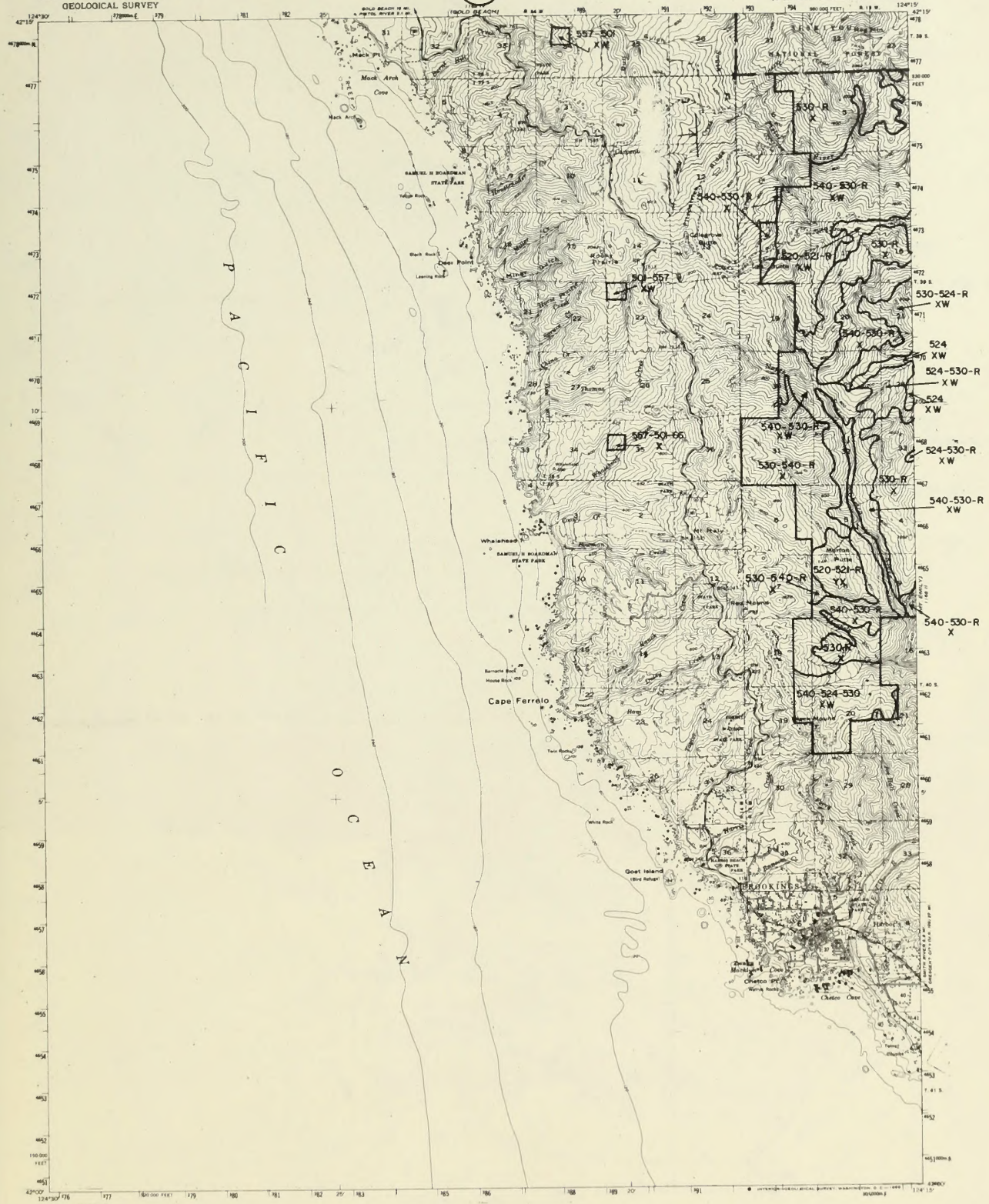

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EMILY QUADRANGLE
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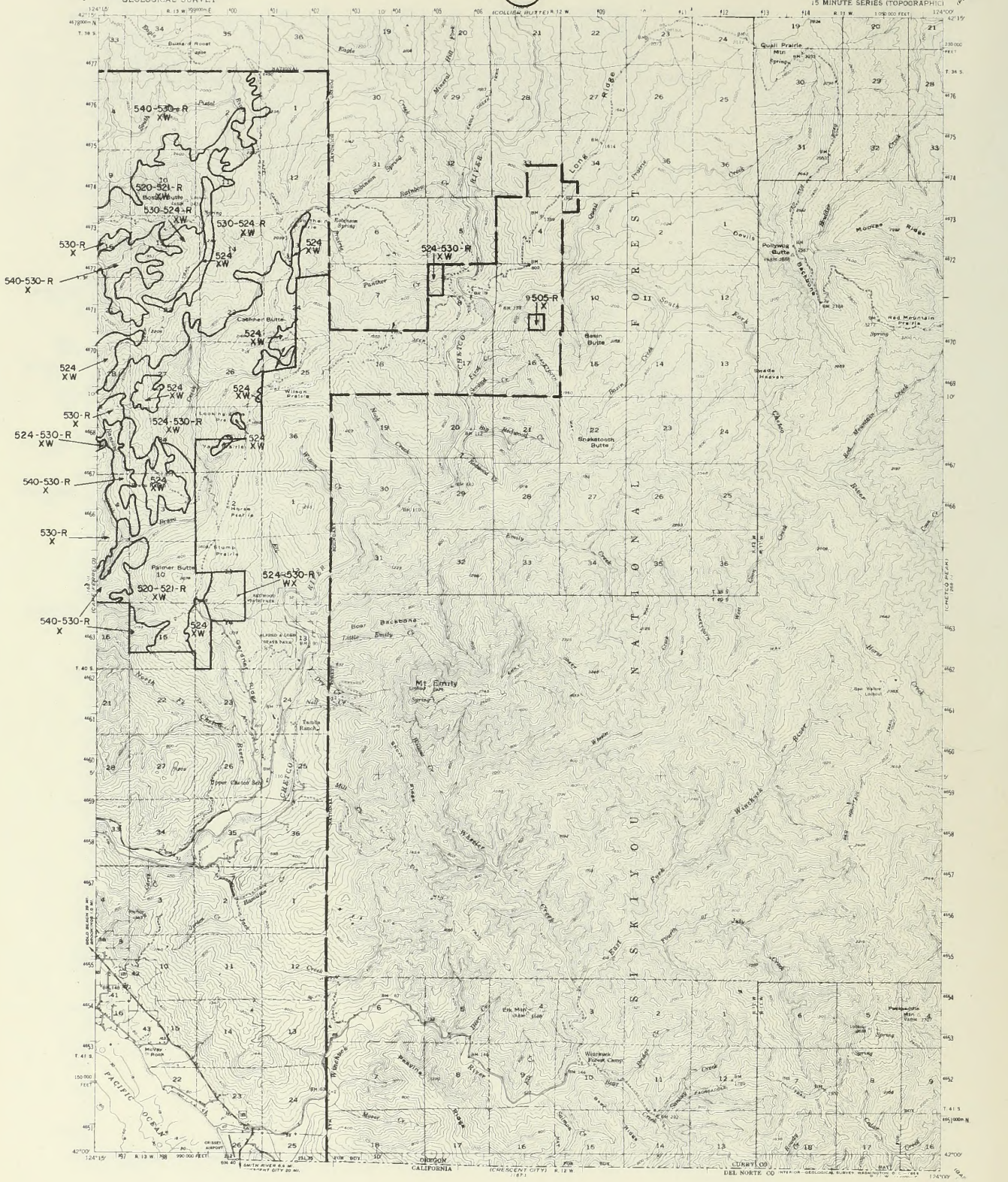

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COOS BAY DISTRICT

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BORROWER	OFFICE	DATE RETURNED
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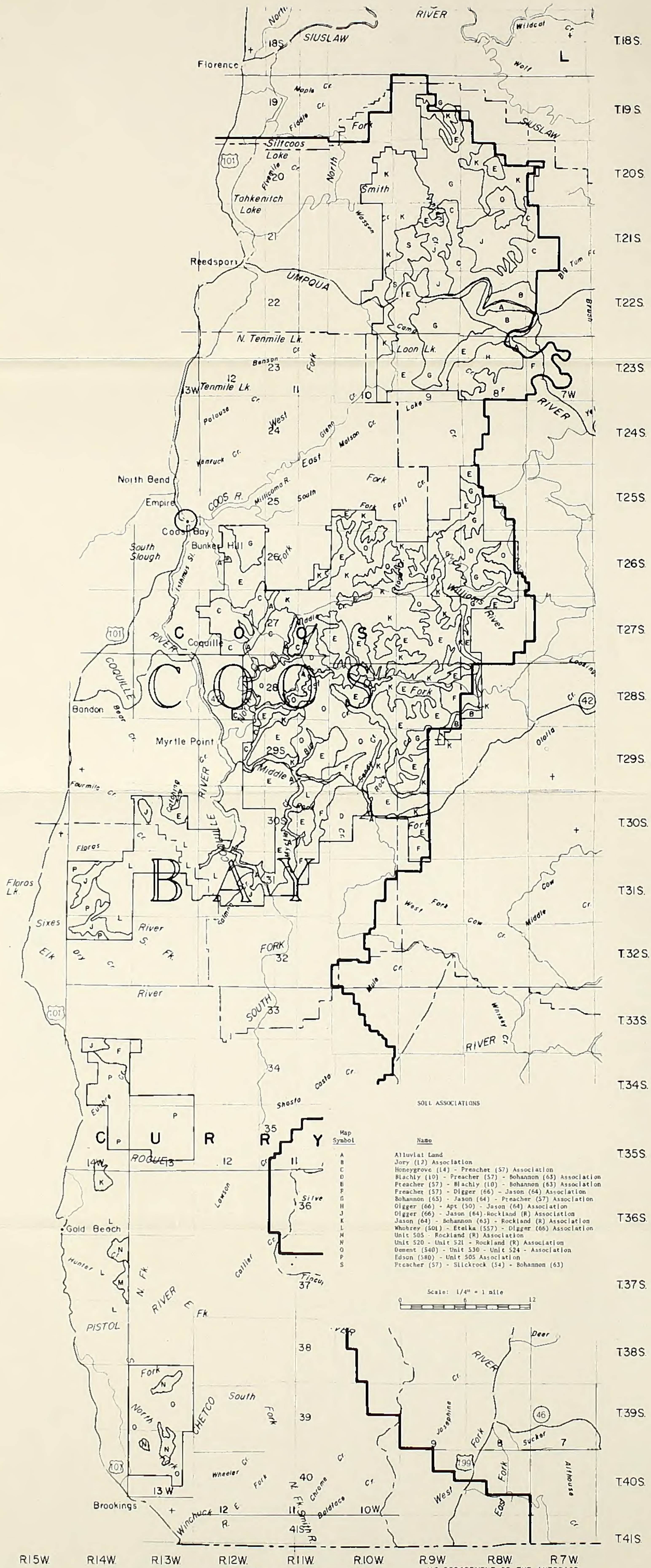

GENERAL SOIL MAP

1976

U.S. DEPARTMENT OF THE INTERIOR
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U.S. DEPARTMENT OF THE INTERIOR
March 3, 1849