OCHOCO NATIONAL FOREST

SOIL RESOURCE INVENTORY

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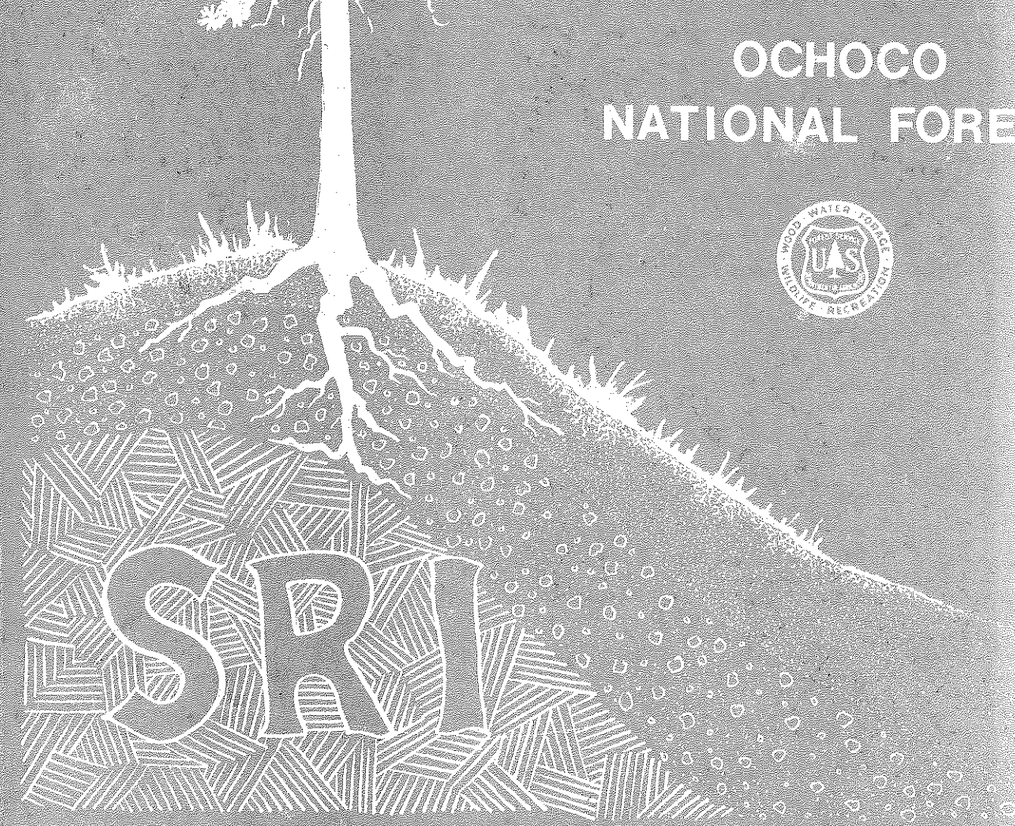

FOREST SERVICE - PACIFIC NORTHWEST REGION

OCHOCO NATIONAL FOREST

SOIL RESOURCE INVENTORY

PACIFIC NORTHWEST REGION

DECEMBER 1977

PREPARED BY

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PREFACE

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

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

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

This report contains information on climate, soils, geology, landform features, and soil management interpretations. Also included is a map section showing location and extent of the various landtype mapping units and mapping unit complexes.

The field mapping was completed in several stages and by different people. Garwin Carlson mapped the Mill Creek drainage in 1970 and the upper Ochoco Creek drainage in 1971. Carlson and Earle Rother completed the Snow Mountain District's portion in 1971. The remainder of the Forest was mapped by Paulson beginning in 1972 through 1974. The mapping of the Crooked River National Grassland relied on published soil surveys (Oregon 1969; USDA 1958, 1975b). These surveys were then modified to an SRI level of landtype survey.

In writing this report, descriptions and interpretations for landtypes and soils of the Snow Mountain District were adapted from the Soil Resource Inventory for the Malheur National Forest (Carlson, 1974). The Crooked River National Grassland landtype descriptions and interpretations were adapted from the published soil surveys in and adjacent to the area (Oregon 1969; USDA 1958, 1975b). Soil Conservation Service descriptions of established series and soil interpretations on OR-SOILS-I forms were also used for selected series.

Valuable assistance, advice, and cooperation received from Forest personnel during the course of the survey was sincerely appreciated. Supervision was provided by Loren Herman.

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Introduction

USE

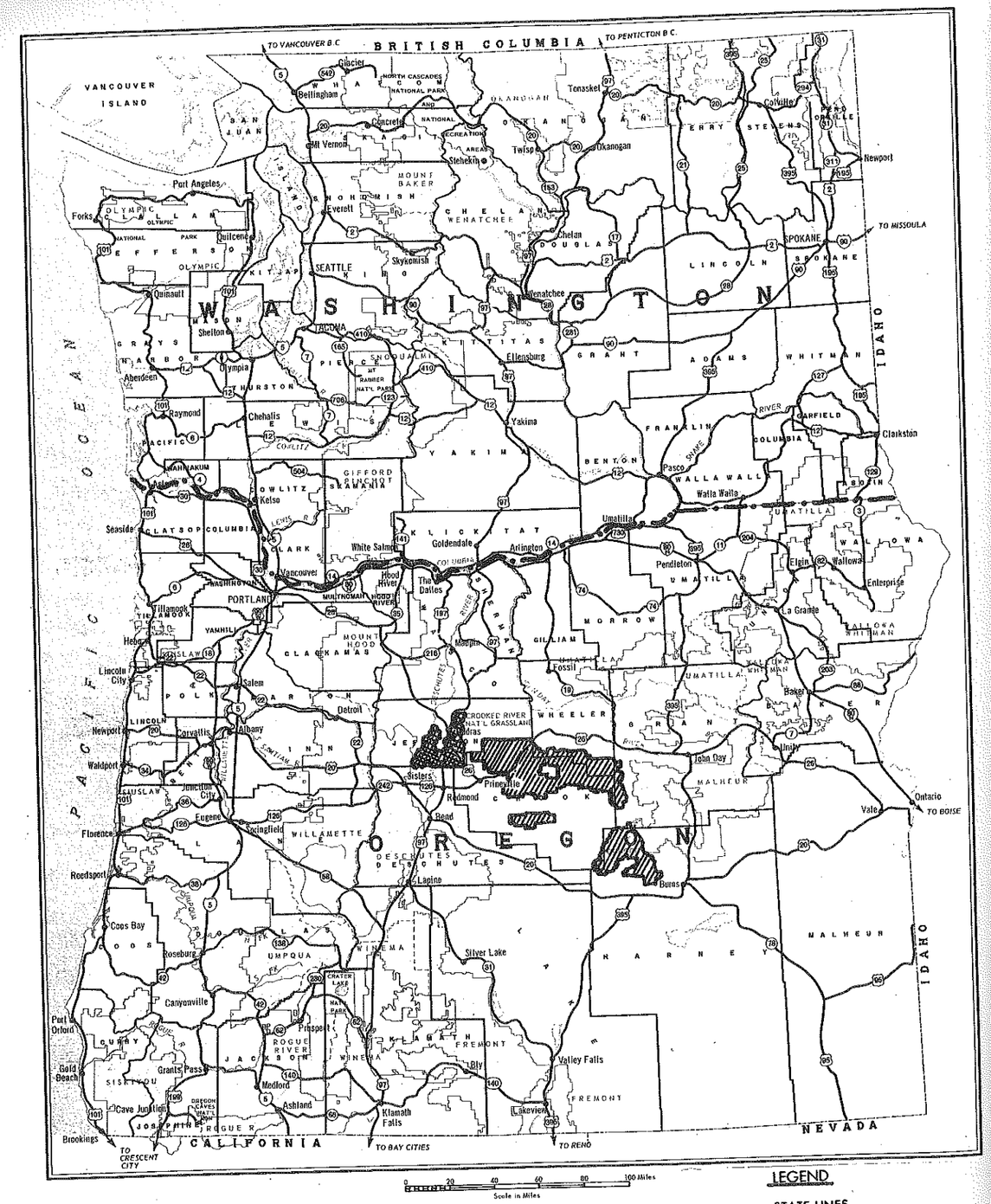
Land management activities generally relate to the soil resource. Timber harvest, road construction, recreation development, and many other activities have an effect on the soil resource to some degree. It is extremely important for the land manager to thoroughly understand the effect of the various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

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

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

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

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



U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

PACIFIC NORTHWEST REGION

FIGURE 1

INDEX MAP

USFS R-6 1974

DESCRIPTION OF SURVEY AREA

The survey area consists of 843,644 acres of Ochoco National Forest and 106,138 acres of Crooked River National Grassland. It extends from the foothills of the Cascades along the Deschutes River east to the South Fork of the John Day River, a distance of approximately 90 air miles; north to the Pelton Dam near Madras; and south to include the Maury Mountains on the west and near the town of Burns on the east.

CLIMATE

The area's climate is characterized by abundant sunshine; high evaporation; and wide daily, monthly, and yearly temperature extremes. Summers are usually hot and dry. Winters are typically cool and moist. Prevailing winds are annually southwest to west. Wind speed seldom exceeds 50 m.p.h.

Temperature

Summers are hot, springs and falls are cool, and winters are moderately cold resulting in a fairly wide annual fluctuation. Annual seasonal ranges in and around the area are from highs of about 100 and slightly above to lows of about 0° to -10° F. Extremes are highs of 119° F and -37° F in Prineville. The coldest month is January. The warmest month is July.

Wide daily fluctuations are characteristic throughout the year. Warm summer days often have cool nights reaching temperatures in the 40's and 50's. Freezing can occur any month of the year. Cold winter nights are often followed by daytime temperatures in the 30's and 40's.

At Prineville, the mean number of days with temperatures above and below 32° F for the same day is 189.

Precipitation

Most precipitation occurs between October and June. Snowfall accounts for approximately 50 percent of this above 4,000 feet.

The average annual precipitation ranges from 10 inches at lower elevations of 2,000 to 3,000 feet to about 45 to 50 inches at higher elevations of 6,500 to 7,000 feet. Most of the National Forest lands receive approximately 19 to 40 inches. Nearly all of the Crooked River National Grassland gets less than 12 inches annually. High intensity rainfalls are likely to occur yearly during the spring and summer months. These storms are usually isolated and appear to follow certain belts in a southwestern to northeasterly direction across the Forest.

SUMMARY OF MEAN PRECIPITATION (INCHES) AND MEAN
ANNUAL TEMPERATURE (DEGREES F) FOR SELECTED STATIONS

This table includes climatic data from U.S. Weather Bureau stations on and adjacent to the Ochoco National Forest. All stations with precipitation and temperature records are of low to mid-elevations under 4,150 feet and don't reflect the predominate forest conditions which ranges from 4,000 to 6,000 feet. This table reflects an elevational range of 2,200 to 4,150 feet and shows variations for the latitude and longitude differences within this area. One station, Marks Creek Guard Station, at 4,600 feet, only has precipitation records and is included to show the continuing trend of increased precipitation with increase of elevation.

TABLE 1

SUMMARY OF MEAN PRECIPITATION (INCHES) AND
MEAN ANNUAL TEMPERATURE (DEGREES F) FOR SELECTED STATIONS

	J	F	M	A	M	J	J	A	S	O	N	D	ANNUAL
MADRAS, JEFFERSON CO. (ELEV. 2,256 FT.)													
Precipitation (10 yrs.)	1.27	1.13	.99	.59	1.33	.85	.36	.27	.41	.62	1.36	1.34	10.52
Temperature (30 yrs.)	30.2	35.1	40.0	46.0	52.8	58.9	65.6	63.6	57.4	47.9	38.1	33.7	47.4
METOLIUS IW, JEFFERSON CO. (ELEV. 2,500 FT.)													
Precipitation (10 yrs.)	1.41	1.11	.95	.55	1.36	.94	.26	.35	.38	.72	1.47	1.52	11.02
Temperature (15 yrs.)	29.6	35.3	39.2	46.0	52.5	57.9	64.8	63.1	57.7	47.8	38.4	33.5	47.2
PRINEVILLE 4NW, CROOK CO. (ELEV. 2,868 FT.)													
Precipitation (60-62 yrs.)	.99	.84	.66	.70	1.09	.99	.30	.31	.57	.78	1.10	1.04	9.37
Temperature (62 yrs.)	31.0	35.5	40.0	46.0	52.2	57.8	64.5	62.6	56.0	48.1	39.7	33.3	47.2
GRIZZLY, JEFFERSON CO. (ELEV. 3,639 FT.)													
Precipitation (10 yrs.)	1.41	1.30	1.38	.84	2.12	1.25	.24	.39	.65	1.14	1.64	1.60	13.96
Temperature (15 yrs.)	29.0	33.8	36.6	43.1	50.0	55.4	62.8	61.0	56.1	46.8	37.8	33.6	45.5
OCHOCO RANGER STATION, CROOK CO. (ELEV. 3,979 FT.)													
Precipitation (29-31 yrs.)	2.19	1.75	1.60	1.31	1.71	1.68	.58	.60	.75	1.65	2.48	2.75	19.05
Temperature (21-23 yrs.)	24.3	29.5	34.4	41.6	48.6	53.8	61.4	59.7	55.2	45.5	34.4	28.7	43.1
MARKS CREEK GUARD STATION, CROOK CO. (ELEV. 4,600 FT.)													
Precipitation (6-7 yrs.)	3.10	2.20	2.49	1.88	1.76	1.46	.78	.77	.73	1.57	3.77	3.75	24.26
Temperatures (none)	-	-	-	-	-	-	-	-	-	-	-	-	-

TABLES OF CALCULATED MONTHLY AND ANNUAL PRECIPITATION AND TEMPERATURE BY ELEVATIONS*

These tables attempt to simulate the climatic conditions that occur because of elevation.

TABLE 2
MONTHLY PRECIPITATION BY ELEVATION
(INCHES)

	ELEVATION (FEET)					
MONTH	Ochoco R.S. 3,979	4,500	5,000	5,500	6,000	6,500
October	1.65	2.1	2.6	3.0	3.5	4.0
November	2.48	3.2	3.9	4.5	5.1	5.8
December	2.75	3.6	3.4	5.2	5.9	6.7
January	2.19	2.8	3.4	4.0	4.6	5.1
February	1.75	2.4	2.8	3.3	3.7	4.3
March	1.60	2.1	2.5	2.9	3.3	3.8
April	1.31	1.7	2.0	2.3	2.6	2.9
May	1.71	2.2	2.7	3.2	3.7	4.2
June	1.68	2.3	2.8	3.3	3.8	4.3
July	.58	.8	1.1	1.4	1.6	1.9
August	.60	.9	1.2	1.5	1.7	2.0
September	.75	1.0	1.3	1.7	2.1	2.3
ANNUAL	19.05	25.1	29.7	36.3	41.3	47.3

* Compiled by Wood, D.C., (report in preparation), "Predicting Soil Moisture for Planting Needs", (Appendix A), Ochoco National Forest.

TABLE 3
MONTHLY TEMPERATURE BY ELEVATION
(DEGREES F.)

	ELEVATION (FEET)					
	Ochoco R.S. 3,979	4,500	5,000	5,500	6,000	6,500
October	45.5	44.0	43.0	42.0	41.0	40.0
November	34.4	32.0	29.0	27.0	24.0	22.0
December	28.7	26.0	25.0	23.0	20.0	19.0
January	24.3	21.0	18.0	15.0	12.0	10.0
February	29.5	26.0	24.0	22.0	19.0	16.0
March	34.4	31.0	29.0	26.0	23.0	21.0
April	41.6	40.0	38.0	36.0	34.0	32.0
May	48.6	47.0	46.0	44.0	42.0	41.0
June	53.8	52.0	50.0	49.0	47.0	45.0
July	61.4	60.0	59.0	57.0	56.0	55.0
August	59.7	58.0	57.0	55.0	54.0	52.0
September	55.2	55.0	55.0	54.0	54.0	54.0
ANNUAL	43.1	41.0	39.4	37.5	35.5	33.9

GENERALIZED TOPOGRAPHY AND GEOLOGY

Within the survey area are two physiographic divisions of Oregon. The Crooked River National Grassland is the northern most extension of the high lava plains physiographic division. The Ochoco National Forest is a southwestern extension of the Blue Mountains (Baldwin, 1959, Figure 1).

The survey area can be considered as three generally different topographic areas. The Crooked River National Grassland is a separate area and lies at the northwestern edge of the survey area. Another area is the western portions of the Ochoco and Maury Mountains. The third area is the eastern portions of the Ochoco and Maury Mountains and the Snow Mountain Ranger District.

The Crooked River National Grassland

This area generally has low relief with nearly level lava plains on the western portion and gently sloping to undulating topography with isolated buttes and ridges on the eastern portion. Elevation generally ranges from 2,500 to 3,500 feet with extremes of 2,200 feet at Pelton Dam on the Deschutes River near Madras and rising to 5,108 feet on top of Gray Butte near Prineville.

The Western Ochoco and Maury Mountains

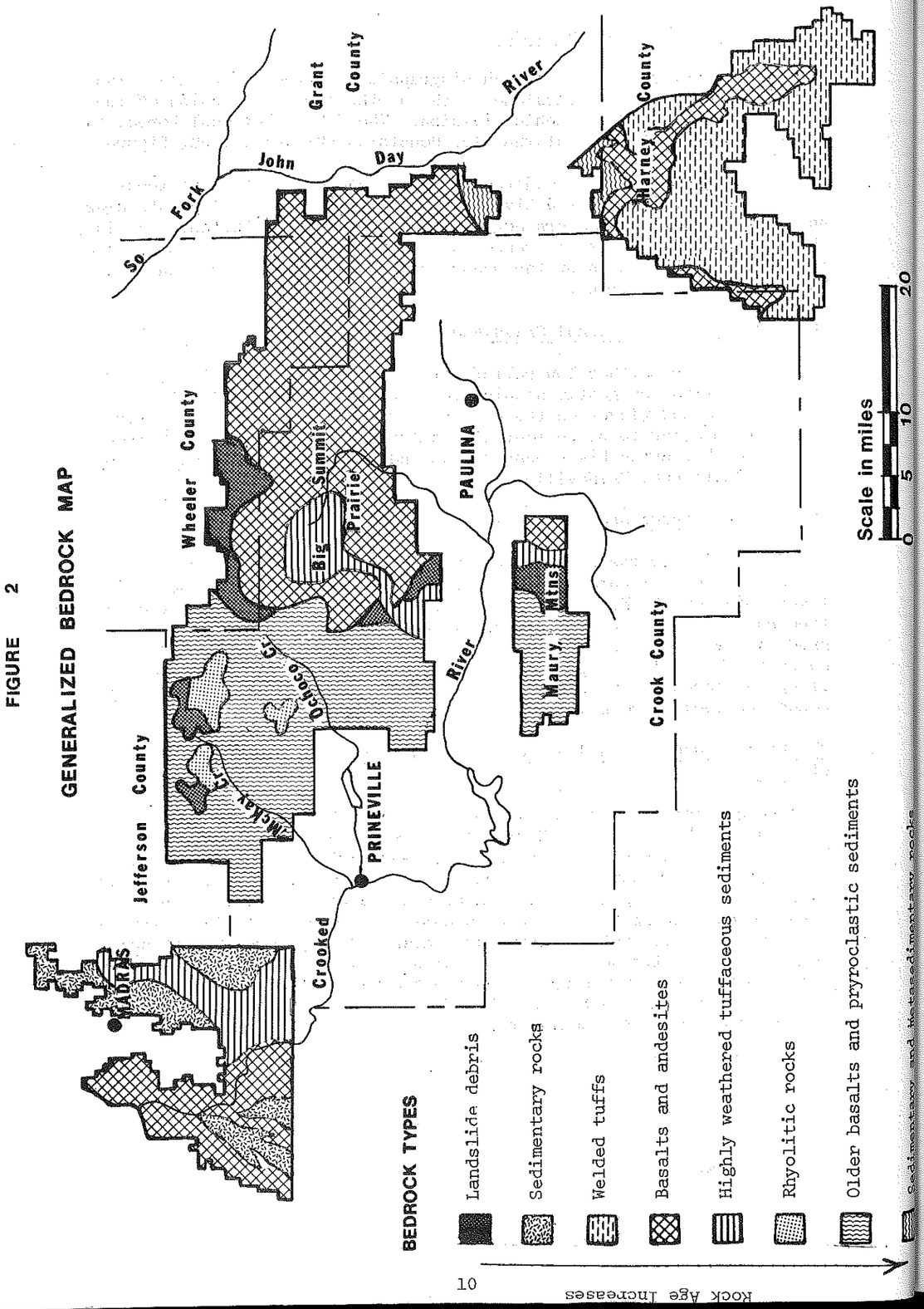
This area lies to the west of an approximate line running north and south from Round Mountain through Lookout Mountain on the Ochocos to Tower Point on the Maurys. The landscape has rolling to steeply dissected topography forming the most rugged lands of the survey area. Slope gradients are commonly in excess of 30 percent but seldom exceed 70 percent. Elevation ranges from around 3,500 feet at the lower points along the Forest perimeter to about 7,000 feet at the higher peaks of Round and Lookout Mountains.

The Eastern Ochoco and Maury Mountains and the Snow Mountain Ranger District

This area consists of the Snow Mountain Ranger District and eastern portions of the Ochoco and Maury Mountains. These are separate areas but can be characterized as dipping plateau regions. They generally tilt slightly downward to the south from their uplifted northern edges where major faulting and displacement has occurred. The plateau landscape is undulating to rolling with numerous broad, open flats streaked by gently sloping stringer draws of timber. This general topography is broken occasionally by deep major drainages and isolated mountain peaks and buttes. Elevation ranges from about 3,500 feet at the lower points along the Forest perimeter to 7,163 feet at Snow Mountain, the highest peak on the Ochoco National Forest.

FIGURE 2

GENERALIZED BEDROCK MAP



BEDROCK TYPES

These descriptions briefly describe the bedrock types shown on the preceding Generalized Bedrock Map.

Landslide Debris

Mostly unstratified and unsorted mixtures of basalt and highly weathered tuffaceous sedimentary rocks. Major slide movement probably occurred during Pleistocene Epoch with most slides considered still active (Swanson, 1969). Landslide movement attributed to where resistant basalts and welded tuffs formations collapsed when the bearing strength of underlying clayey tuffaceous sediments of John Day or Clarno formations failed. The resulting topography is broken and hummocky with numerous smaller slumps scattered throughout. With present climatic and vegetation conditions, these slump areas appear quite stable.

Associated landtypes: L1, L2, L3, L5, L6, L7, L8.

Sedimentary Rocks

Geologically young rock of early Pliocene age (Beaulieu, 1972, p. 16) consisting principally of lacustrine and fluvial sediments and interbedded in places with tuffs and lavas. Sediments are mainly unconsolidated and tuffaceous. They are sandstones, siltstones, claystones, mudflow breccias, and conglomerates. These rocks were mapped as the Dalles formation by Waters (1968) and according to Baldwin (1969, p. 74) have been called the Deschutes formation and also the Madras formation.

Associated landtypes: E1, E2, E3, E5, E7, E8, F1, F2, G7.

Welded Tuffs

Pliocene aged welded ash flow tuffs of Double O Ranch and Devine Canyon (Green, Walker, and Corcoran, 1972). These rocks are moderately hard to hard and resistant to weathering. Their texture consists of abundant pumice and crystal fragments within a fine-grained matric. The rock structure ranges from massive to platy. The colors of freshly textured surfaces are shades of gray to light brown. (These rocks are referred to as rhyolites in the landtype descriptions.)

Associated landtypes: Q1, Q2, Q3, Q4, Q7, Q8, Q9.

Basalts and Andesites

Miocene to early Pleistocene aged rocks (Brown and Thayer, 1966). These are fine-grained, hard, and moderately to highly fractured. Platy and blocky fracturing is most common with occasional areas of columnar jointing. Colors of fresh fractures range from black to dark gray. These rocks form the more resistant rimrocks of the plateaus and mountain slopes.

Associated landtypes: Crooked River National Grassland - D1, E2, E3, E6, F1, F2, G7, H2, H3, J0, J1, J3. Ochoco or Maury Mountains - P1, P2, P3, P4, P5, P8, P9, X6, X7, X8, X9, Y1, Y2, Y3, Y4, Y7, Y8, Y9, S1. Snow Mountain District - N1, N2, N3, N7, N8, N9.

Highly Weathered Tuffaceous Sediments

Middle Oligocene and lower Miocene aged tuffs and tuffaceous sediments. These are principally siltstones and claystones of the John Day formation (Swanson, 1969). Much of the rocks have been weathered to clays of red color but shades of green and buff are common. This formation has been widely eroded from most former locations that haven't been capped by lava flows.

Associated landtypes: Crooked River National Grassland - E4, G1, G2, G3, J5. Ochoco or Maury Mountains - T2, T3, T5, T6, T7, T8.

Rhyolitic Rocks

Age is uncertain but thought to be early to middle Oligocene associated with John Day or Clarno times (Swanson, 1969). Consists mainly of rhyolite flows and domes with some local interbedding of tuffs. The rhyolite flows are nearly horizontal and form highland plateaus and benches surrounded by more broken topography. This rhyolite is dark pinkish in color and banded by lighter colored streaks. It is moderately hard to hard and is fractured into various size plates and blocks ranging from a few inches to a number of feet in thickness.

Associated landtypes: R1, R2, R3, R4, R5, R6, R7 (J3, J6 - small areas on Crooked River National Grassland.

Older Basalts and Pryroclastic Sediments

Eocene and lower Oligocene aged rocks of the Clarno formation. The rocks consist of andesitic and basaltic flows and domes and volcanic breccias interlayered by tuffaceous sediment. These usually are highly weathered often to montmorillonitic clays (Swanson, 1969). The different rock layers reach to several tens of feet thick and have been tilted and warped in most areas. The harder basalts form the steep slopes of ridges and domes while the softer rocks create the gentler sloping toeslopes, basins, and benches.

Associated landtypes (old basalts): B1, B4, B5, B6, B7, B8, B9
Associated landtypes (pryroclastic sediments): T2, T3, T5, T6, T7, T8, X3.

Sedimentary and Metasedimentary Rocks

Upper Triassic to upper Jurassic aged beds of sedimentary rocks (Green, Walker, and Corcoran, 1972). Rock layers are typically tilted, twisted, and faulted. These rocks include layers of sandstones, mudstones, and shales. Some of these are calcareous and some thin beds of limestone are present. The sediments range from being soft to hard and are highly fractured with a blocky and platy fracture system. Colors for fresh fractures range from gray to brown to black.

Associated landtypes: V1, V2, V3, V4, V5, V6, V7, V8.

Mapping Unit Descriptions

DEFINITIONS OF MAPPING UNITS

Mapping units are shown on the landtype maps with letter plus number symbols. Mapping units contain a dominant landtype which accounts for at least 70 percent of the landtype delineation.

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

Miscellaneous Mapping Units

Some of the mapping units are considered miscellaneous mapping units or miscellaneous landtypes and are too variable to be described by a definable range of characteristics. They are described by a short narrative description and identified as miscellaneous landtypes in the Table of Soil Characteristics of Modal Site. Soil materials are too variable to make certain management interpretations.

Mapping Unit Complexes

Mapping unit complexes are shown on the maps with three digits. These are mapping units used in areas where two or more defined mapping units are present in an arrangement too complex to separate at the one-inch per mile scale. The legend of mapping unit complexes indicates the mapping unit components of the complex and the approximate percentage of each component. Refer to each mapping unit for information desired.

Mapping Unit Descriptions

The mapping units containing at least 70 percent of one landtype are described in detail. These landtypes have a definable range of characteristics that can be represented by a soil profile description. The miscellaneous mapping units are described in a short narrative. The characteristics of mapping unit complexes are derived from their component mapping unit descriptions.

Information in Mapping Unit Descriptions

The first paragraph states the primary landtype and the most common landtype inclusions found within the mapping unit. The second paragraph gives a brief generalized description of the primary soil. The third paragraph briefly describes the bedrock occurring in the landtype. The fourth paragraph describes the landform and slope. The fifth paragraph describes the elevation and vegetation type. The sixth paragraph describes the drainage class and permeability rates. Reference should be made to the glossary for definitions of terms used in these descriptions.

Range of Profile Characteristics

This describes the range of soil profile characteristics that have been recognized for the dominant landtype within the mapping unit. Reference should be made to Table of Soil Characteristics of Modal Site for definitions of terms used in these profile descriptions.

MAPPING UNIT DESCRIPTIONS

MAPPING UNIT A1

This is a miscellaneous mapping unit occurring as low stream terraces. Slope gradients are generally less than 15 percent. Vegetation ranges from wet to moist meadow types, consisting of sedges, forbs, and grasses with scattered alder and aspen. Elevation ranges from 3,800 to 5,500 feet. Soils are variable in texture and parent material. They are poorly to somewhat poorly drained. Depth to bedrock ranges from 20 to over 60 inches.

MAPPING UNIT A2

This is a miscellaneous mapping unit occurring on all aspects of stream terraces and alluvial fans. Slope gradients are generally less than 20 percent. Vegetation consists primarily of dry meadow, big sagebrush, and ponderosa pine types. Elevation ranges from 3,800 to 5,500 feet. Soils are moderately well to well drained and are variable in texture and parent materials. Depth to bedrock ranges from 40 to over 60 inches.

MAPPING UNIT A4

This is a miscellaneous mapping unit occurring on all aspects of stream terraces and alluvial fans. Slope gradients generally are less than 15 percent. Vegetation ranges from wet to dry meadow types. Elevation ranges from 3,200 to 6,500 feet. Soils are variable in texture and range in drainage from poorly to well drained. Depth to bedrock exceeds 24 inches and averages around 48 inches.

MAPPING UNIT B1

Mapping unit B1 consists dominantly of landtype B1 and minor amounts of landtypes B4, B7, B9, and B5. Landtype B1 is similar to Landtype B4 with the exception of landform. B1 occurs on steep and very steep lands but is highly dissected.

Landtype B1 has very shallow to shallow soils derived from loess mixed with residuum and colluvium. Surface soils are very thin to thin, nongravelly to very gravelly textures of loams, silt loams, and clay loams. Subsoils are nonexistent to thin, nongravelly to very gravelly textures of silty clay or clay.

Bedrock is composed of moderately hard to hard andesites, basalts, breccias, or sediments. It is moderately to highly fractured and is competent. Depth to bedrock ranges from 5 to 17 inches.

Typically, landtype B1 occurs on all aspects of highly dissected slopes that are steep to very steep. Slope gradients are greater than 30 percent.

This landtype ranges in elevation from 3,500 to 5,000 feet. It supports community types ranging through scabland, low and rigid sagebrush, bunchgrass, juniper, and low site ponderosa pine - wheatgrass types.

The soil is well drained. Permeability is moderate to slow in the surface soils and slow to very slow in the subsoils.

Range of Profile Characteristics of Soil B1

Litter: Needles, leaves, twigs, and decomposing organic matter; 0 - 2 inches. Gravelly and cobbly surfaces exist on much of these soils.

Surface Layers: Dark brown, dark reddish brown, or very dark brown; nongravelly to very gravelly; loams, silt loams, or clay loams; weak, fine, granular to weak, very fine, subangular blocky structure; 10 to 70 percent gravels and cobbles by volume; slightly sticky to sticky, slightly plastic to plastic; pH range of 7.0 to 7.5; 1 to 11 inches thick.

Subsoil Layers: Dark brown; nongravelly to very gravelly; silty clays or clays; moderate to strong, very fine, subangular blocky to blocky structure; 10 to 70% angular gravels and cobbles by volume; sticky, very plastic; pH range of 7.0 to 8.0; 0 to 8 inches thick.

MAPPING UNIT B4

Mapping unit B4 consists dominantly of landtype B4 and minor amounts of landtypes B5, B7, B1, and T3. Landtype B4 is similar to landtype B5 with the exception of slope gradient. B4 has greater than 35 percent slope gradients.

Landtype B4 has very shallow to shallow soils derived from loess mixed with residuum and colluvium. Surface soils are very thin to thin, nongravelly to very gravelly textures of loams, silt loams, or clay loams. Subsoils are nonexistent to thin, nongravelly to very gravelly textures of silty clay or clay.

Bedrock is composed of moderately hard to hard andesite, basalts, breccias, or sediments. It is moderately to highly fractured and is competent. Depth to bedrock ranges from 5 to 17 inches.

Typically, landtype B4 occurs on all aspects of straight to convex slopes that are steep to very steep. Slope gradients are greater than 30 percent.

This landtype ranges in elevation from 3,500 to 6,500 feet and supports community types ranging through scablands, bunchgrass, juniper, and low site ponderosa pine - wheatgrass types.

The soil is well drained. Permeability is moderate to slow in the surface soils and slow to very slow in the subsoils.

Range of Profile Characteristics of Soil B4

Litter: Needles, leaves, twigs, and decomposing organic matter; 0 - 2 inches. Gravelly and cobbly surfaces exist on much of these soils.

Surface Layers: Dark brown, dark reddish brown, or very dark brown; nongravelly to gravelly; loams, silt loams, or clay loams; weak, fine, granular to weak, very fine, subangular blocky structure; 10 to 70 percent gravels and cobbles by volume; slightly sticky to sticky, slightly plastic to plastic; pH range of 7.0 to 7.5; 1 to 11 inches thick.

Subsoil Layers: Dark brown; nongravelly to very gravelly; silty clays or clays; moderate to strong, very fine, subangular blocky to blocky structure; 10 to 70% angular gravels and cobbles by volume; sticky, very plastic; pH range of 7.0 to 8.0; 0 to 8 inches thick.

MAPPING UNIT B5

Mapping unit B5 consists dominantly of landtype B5 and minor amounts of landtypes B7, T3, B7, T2, and B9. Landtype B5 is similar to landtype B4 with the exception of slope gradient.

Landtype B5 has very shallow to shallow, slightly plastic to plastic soils derived from loess mixed with residuum and colluvium. Surface soils are very thin to thin, nongravelly to gravelly textures of loams, silt loams, or clay loams. Subsoils are nonexistent to thin, nongravelly to very gravelly textures of silty clay or clay.

Bedrock is composed of moderately hard to hard andesites, basalts, breccias, or sediments. It is moderately to highly fractured and is competent. Depth to bedrock ranges from 5 to 17 inches.

Typically, landtype B5 occurs on all aspects of smooth, gently rolling to moderately steep upland flats and sideslopes. Slope gradients are less than 30 percent.

This landtype ranges in elevation from 3,500 to 6,500 feet and supports community types ranging through scablands, bunchgrass, juniper, and low producing ponderosa pine - wheatgrass types.

The soil is well drained. Permeability is moderate to slow in the surface soils and slow to very slow in the subsoils.

Range of Profile Characteristics of Soil B5

Litter: Needles, leaves, twigs, and decomposing organic matter; 0 - 2 inches. Gravelly and cobbly surfaces to the extreme of having erosion pavement on much of these soils.

Surface Layers: Dark brown, dark reddish brown, very dark brown; nongravelly to gravelly; loams, silt loams, or clay loams; weak, fine, granular to weak, very fine, subangular blocky structure; 10 to 70 percent gravels and cobbles by volume; slightly sticky to sticky, slightly plastic to plastic; pH range of 7.0 to 7.5; 1 to 11 inches thick.

Subsoil Layers: Dark brown; nongravelly to very gravelly; silty clays or clays; moderate to strong, very fine, subangular blocky to blocky structures; 10 to 70% angular gravels and cobbles by volume; sticky, very plastic; pH range of 7.0 to 8.0; 0 to 8 inches thick.

MAPPING UNIT B6

Mapping unit B6 consists dominantly of landtype B6 and minor amounts of landtypes B5, B4, B7, and B9. Landtype B6 is similar to landtype B9 with the exception of slope gradient and land position.

Landtype B6 has shallow to moderately deep soils. Surface soils are very thin to thin, derived from mixtures of ash, loess, and residuum and have loam, silt loam, loamy sand, and sandy loam textures. Subsoils are thin to moderately thick, developed in residuum with nongravelly to gravelly textures of clay loams, silty clay loams, and clays.

Bedrock is composed of moderately hard to hard, moderately to highly fractured sedimentary and basaltic rock of the Clarno formation. It is competent. Depth to bedrock ranges from 18 to 40 inches.

Typically, landtype B6 occurs on smooth, gentle to moderately steep upland flats and benches with any aspect. Slope gradients range from 2 to 20 percent.

This landtype ranges in elevation from 5,000 to 6,500 feet and supports community types of mixed conifer - pinegrass, residual soils, and mixed conifer - pinegrass, ash soils in mixed conifer stages.

The soil is moderately well to well drained. Permeability is moderate to rapid in the surface soils and slow to very slow in the subsoils.

Range of Profile Characteristics of Soil B6

Litter: Needles, leaves, twigs, and decomposing organic matter; 1 to 3 inches thick.

Surface Layers: Dark brown to very dark brown, loamy sand, sandy loams, loams, and silt loams; weak, fine, granular to weak, very fine, subangular blocky; 0 to 10 percent angular gravels by volume; slightly sticky, nonplastic to slightly plastic; pH range of 5.7 to 6.8; 1 to 16 inches thick.

Subsoil Layers: Dark yellowish brown to brown; nongravelly to gravelly; clay loams, silty clay loams, and clays; moderate to strong, very fine to medium; subangular blocky structure; 10 to 50 percent, subangular to angular, gravels and cobbles by volume; sticky to very sticky, plastic to very plastic; pH ranges of 6.7 to 6.9; 9 to 19 inches thick.

MAPPING UNIT B7

Mapping unit B7 consists dominantly of landtype B7 and minor amounts of landtypes T3, B4, and B8. Landtype B7 is similar to landtype B8 with the exception of vegetation. B7 has ponderosa pine type and B8 has mixed conifer type. Similar to B4 in landform but different in vegetation types.

Landtype B7 has moderately deep to deep soils. Surface layers are thin to moderately thick derived from mixed ash, loess, and colluvium having nongravelly to very gravelly sandy loams, loams, and silt loams. Subsoils are sometimes absent but normally are thin to moderately thick buried soils developed in pyroclastic and sedimentary colluvium having gravelly to very gravelly clay loams, silty clays, and clays.

Bedrock consists of moderately hard to hard, moderately to highly fractured sedimentary and basaltic rocks of the Clarno formation. It is moderately competent to competent. Depth to bedrock ranges from 20 to 60 inches.

Typically, landtype B7 occurs on southerly aspects of steep to very steep, smooth to moderately dissected ridges and upland sideslopes. Slope gradients range from 30 to 70 percent.

This landtype ranges in elevation from 3,500 to 6,200 feet and supports community types of ponderosa pine - fescue, ponderosa pine - elk sedge, and mixed conifer - pinegrass, residual soils in pine dominated stages.

The soil is well drained. Permeability is moderate to rapid in the surface soils and slow to very slow in the subsoils.

Range of Profile Characteristics of Soil B7

Litter: Needles, leaves, twigs, and decomposed organic matter, 1 to 2 inches thick.

Surface Layers: Very dark grayish brown to very dark brown; gravelly to very gravelly; sandy loams, loams, and silt loams; 15 to 60 percent angular to platy gravels and cobbles by volume; weak to moderate, very fine, granular structure; nonsticky to slightly sticky, nonplastic to slightly plastic; pH ranges from 5.8 to 7.2; 6 to 30 inches thick.

Subsoil Layers: Dark brown to dark yellowish brown; gravelly to very gravelly; clay loams, silty clays, and clays; 35 to 60 percent angular to platy gravels, cobbles, and stones by volume; weak to moderate, very fine to fine, subangular blocky structure; sticky to very sticky, plastic to very plastic; pH ranges from 5.8 to 6.8; 0 to 30 inches thick.

MAPPING UNIT B8

Mapping unit B8 consists dominantly of landtype B8 and minor amounts of landtype B7. Landtype B8 is similar to landtype B9 with the exception of aspect. B8 has southerly aspects while B9 has northerly ones.

Landtype B8 has moderately deep to deep soils. Surface soils are thin to moderately thick, derived from ash mixed with loess and colluvium having nongravelly to very gravelly loamy sands, sandy loams, and loams. Subsoils are sometimes absent but normally are thin to moderately thick buried soils developed in pyroclastic and sedimentary colluvium having gravelly to very gravelly clay loams, silty clays, and clays.

Bedrock consists of moderately hard to hard, moderately to highly fractured sedimentary and basaltic rock of the Clarno formation. The bedrock is moderately competent to competent. Depth to bedrock ranges from 20 to 60 inches.

Typically, landtype B8 occurs on smooth, steep to very steep upland sideslopes with southerly aspects. Slope gradients range from 30 to 70%.

This landtype ranges in elevation from 5,000 to 6,500 feet and supports the community type of mixed conifer - pinegrass, ash soils in a mixed conifer stage.

The soil is well drained. Permeability is rapid to moderate in the surface soils and slow in the subsoils.

Range of Profile Characteristics of Soil B8

Litter: Needles, leaves, twigs, and decomposed organic matter; 1 to 3 inches thick.

Surface Layers: Very dark grayish brown, yellowish brown, dark brown, nongravelly to very gravelly; loamy sands, sandy loams, and loams (recent ash and mixed ash); 5 to 70 percent angular to platy gravels and cobbles by volume; single grained to weak, very fine, subangular blocky structure; nonsticky, nonplastic; pH range of 5.8 to 6.7; 6 to 30 inches thick.

Subsoil Layers: Dark brown, yellowish brown to dark reddish gray; gravelly to very gravelly; clay loams, silty clays, and clays; 35 to 60 percent angular to platy gravels, cobbles, and stones by volume; weak to moderate, very fine to fine, subangular blocky structure; sticky to very sticky, plastic to very plastic; pH range of 5.8 to 7.0; 0 to 30 inches thick.

MAPPING UNIT B9

Mapping unit B9 consists dominantly of landtype B9 and minor amounts of landtype T2. Landtype B9 is similar to landtype B8 with the exception of aspect. B9 has northerly aspects and B8 has southerly facing slopes.

Landtype B9 has moderately deep to deep soils. Surface soils are thin to moderately thick, derived from ash overlying or mixed with colluvium having nongravelly to very gravelly loamy sands, sandy loams, and loams. Subsoils are sometimes absent but normally are thin to moderately thick buried soils developed in pyroclastic and sedimentary colluvium having gravelly to very gravelly clay loams, silty clays, and clays.

Bedrock consists of moderately hard to hard, moderately to highly fractured sedimentary and basaltic rock of the Clarno formation. The bedrock is moderately competent to competent. Depth to bedrock ranges from 20 to 60 inches.

Typically, landtype B9 occurs on steep to very steep, smooth to moderately dissected ridges and upland sideslope with northerly aspects. Slope gradients range from 30 to 70 percent.

This landtype ranges in elevation from 4,000 to 6,500 feet and supports community types of white fir - twinflower - forb and mixed conifer - pinegrass, ash soils.

The soil is well drained. Permeability is rapid to moderate in the surface soils and slow in the subsoils.

Range of Profile Characteristics of Soil B9

Litter: Needles, leaves, twigs, and decomposed organic matter; 1 to 3 inches thick.

Surface Layers: Very dark grayish brown, yellowish brown, dark brown; nongravelly to very gravelly; loamy sands, sandy loams, and loams (recent ash and mixed ash); 5 to 70% angular to platy gravels and cobbles by volume; single grained to weak, very fine, subangular blocky structure; nonsticky, nonplastic; pH range of 5.8 to 6.7; 6 to 30 inches thick.

Subsoil Layers: Dark brown, yellowish brown to dark reddish gray; gravelly to very gravelly; clay loams, clay, and silty clays; 35 to 75 percent angular to platy gravels and cobbles by volume; weak to moderate, very fine, subangular blocky structure; sticky to very sticky, plastic to very plastic; pH range of 5.8 to 7.0; 0 to 30 inches thick.

MAPPING UNIT C1

This is a miscellaneous mapping unit occurring on all aspects of moderately steep to very steep sideslopes of deep canyons of the Deschutes and Crooked Rivers. Slope gradients generally are 15 to 100 percent. Cliffs and rock outcroppings of basalt, rhyolite, and sedimentary rock are common. Vegetation consists of juniper, big sagebrush, and bunchgrass types. Elevation ranges from 2,000 to 3,000 feet. Soils are variable in texture, generally well drained, and derived from colluvial materials. Depth to bedrock is variable and can range from exposed rock to over 144 inches.

MAPPING UNIT C2

This is a miscellaneous mapping unit occurring on northerly aspects of moderately steep to very steep scarp slopes on major Pliestocene age landslide areas. Slope gradients are generally 15 to 100 percent. Rock outcroppings and talus slopes are common. Vegetation consists of white fir, Douglas-fir, western larch, lodgepole, and ponderosa pine. Elevation ranges from 5,000 to 7,000 feet. Soils are variable in texture and rock content. They typically have recent volcanic ash surfaces and are well drained. Seeps along the lower slopes are common. Depth to bedrock is variable and can range from exposed rock to over 144 inches.

MAPPING UNIT C3

This is a miscellaneous mapping unit occurring on southerly aspects of moderately steep to very steep scarp slopes on major Pliestocene age landslide areas. Slope gradients are generally 15 to 100 percent. Rock outcroppings and talus slopes are common. Vegetation consists of ponderosa pine, Douglas-fir, fescue, elk sedge, and pinegrass. Elevation ranges from 5,000 to 6,500 feet. Soils are variable in texture but commonly are cobbly and gravelly. The soils are well drained. Depth to bedrock is variable and can range from exposed rock to over 144 inches.

MAPPING UNIT C5

This is a miscellaneous mapping unit occurring on northerly aspects of moderately steep to very steep scarp slopes that cross a variety of bedrock types. Slope gradients range from 15 to 100 percent. Vegetation consists of white fir, Douglas-fir, larch, lodgepole pine, huckleberry, pinegrass, and columbia brome. Elevation ranges from 4,500 to 6,800 feet. Typically, the soil has 15 to 24 inches of recent volcanic ash over a variety of subsoil layers. Soil drainage is variable. Depth to bedrock is variable.

MAPPING UNIT C6

This is a miscellaneous mapping unit occurring on southerly aspects of moderately steep to very steep scarp slopes that cross a variety of bedrock types. Slope gradients range from 15 to 100 percent. Rock outcroppings are common. Vegetation consists of juniper, few scattered ponderosa pine, big sagebrush, low sagebrush, mahogany, fescue, wheatgrass, and sandberg bluegrass. Elevation ranges from 3,600 to 6,800 feet. Soils vary in texture but depth to bedrock is usually less than 20 inches. Soil drainage is variable.

MAPPING UNIT C7

This is a miscellaneous mapping unit occurring on southerly aspects of moderately steep to very steep scarp slopes that cross a variety of bedrock types. Slope gradients range from 15 to 100 percent. Rock outcroppings are common. Vegetation consists primarily of ponderosa pine, fescue, elk sedge, wheatgrass, and sandberg bluegrass. Elevation ranges from 3,200 to 6,000 feet. Soils are variable in bedrock and texture. Depth to bedrock is variable.

MAPPING UNIT C8

This is a miscellaneous mapping unit occurring on all aspects of moderately steep to very steep scarp slopes that cross highly stratified and variable bedrock. Slope gradients range from 15 to 100 percent. Rock outcroppings are quite common. Dominant vegetation consists of ponderosa pine, white fir, Douglas-fir, pinegrass, and elk sedge. Elevation ranges from 3,200 to 6,800 feet. Soils typically have 8 to 12 inches of recent volcanic ash over a variety of subsoil layer materials. Soil drainage is variable. Depth to bedrock is variable.

MAPPING UNIT C9

This is a miscellaneous mapping unit influenced by cold air and snow pack. It occurs at high elevations on northerly aspects of moderately steep to very steep scarp slopes. Slope gradients range from 15 to 100 percent. Talus slopes and rock outcroppings of basalts and tuffs are common. Dominant vegetation consists of white fir, subalpine fir, lodgepole pine, Engelmann spruce, grouse huckleberry, twinflower, and columbia brome. Elevation ranges from 6,000 to 7,000 feet. Typically, the soils have surfaces of recent volcanic ash but highly variable in gravel and cobble content. Subsoil layers are variable in depth and texture. Seeps along the lower slopes are common. Depth to bedrock is variable and ranges from exposed rock to over 144 inches.

MAPPING UNIT D1

Mapping unit D1 consists dominantly of landtype D1 and minor amounts of landtypes E2, E8, and E1. Landtype D1 is similar to landtype E6 with the exception of soil textures.

Landtype D1 has moderately deep soils derived from mixed alluvium with pumice and ash in the upper part. Surface layers are thin to moderately thick with sandy loam or loam textures. Sublayers are very thin to thin with very fine sandy loam or loam textures.

Bedrock is competent, hard basalts with surface coated with lime. Depth to bedrock ranges from 20 to 40 inches. The bedrock surface is coated with lime.

Typically, Landtype D1 occurs on all aspects of nearly level to gentle sloping upland terraces and sideslopes. Slope gradients are generally less than 15 percent.

This landtype ranges in elevation from 2,400 to 3,000 feet and supports mainly bunchgrasses, big sagebrush, rabbitbrush, bitterbrush, and juniper.

The soil is well drained. Permeability is moderate to rapid in the surface soils and moderate to rapid in the subsoils.

Range of Profile Characteristics of Soil D1

Litter: Leaves, stems, and decomposing organic matter, less than 1 inch thick and scattered.

Surface Layers: Very dark grayish brown to dark brown; sandy loams and loams; weak, very fine, granular to weak and medium, subangular blocky structure; 0 to 5 percent subround pebbles by volume; nonsticky, nonplastic to slightly sticky, slightly plastic; pH range of 6.8 to 7.0; 9 to 30 inches thick. (A1 horizon ranges from 2 to 8 inches thick.)

Subsoil Layers: Dark brown to dark yellowish brown; sandy loams and loams; massive; 10 to 25 percent subround to angular gravels and cobbles by volume; slightly sticky, slightly plastic; pH of 7.2; 4 to 15 inches thick.

Soil Profile Notes: Organic matter ranges from about 0.8 to 1.5 percent in top 3 to 4 inches. Below this depth, it is less than 1.0 percent.

MAPPING UNIT E1

Mapping unit E1 consists dominantly of landtype E1 and minor amounts of landtypes E6, E4, E8, and E2. Landtype E1 is similar to landtype E6 with the exception of soils.

Landtype E1 has moderately deep soils derived from alluvium mixed with colluvium. Surface layers are thin to moderately thick with sandy loam or loam textures. Subsoil layers are thin to moderately thick with loam or clay loam textures. Depths to an indurated duripan ranges from 20 to 30 inches. Gravel content can range up to 30 percent by volume. A thin calcareous layer lies above the duripan.

Bedrock is semiconsolidated tuffaceous sandstones at depths of 25 to 40 inches. It is moderately hard.

Typically, landtype E1 occurs on all aspects of nearly level to gently sloping, smooth to rolling upland sideslopes and terraces. Slope gradients are generally less than 15 percent.

This landtype ranges in elevation from 2,100 to 3,300 feet and supports the arid rolling hills range site dominated by bluebunch wheatgrass.

The soil is well drained. Permeability is moderate in the surface soils and slow to very slow in the subsoils.

Range of Profile Characteristics of Soil E1

Litter: Leaves, stems, and decomposing organic matter; less than 1 inch thick and scattered.

Surface Layers: Very dark grayish brown to dark brown; loams and sandy loams; weak to moderate, fine granular structure to weak medium subangular blocky structure; 0-20 percent gravels by volume; slightly hard to hard; very friable to friable; slightly sticky, slightly plastic; pH range of 6.6 to 6.8; 6 to 20 inches thick. (A horizon thickness range of 6 to 14 inches.)

Subsoil Layers: Brown to light brownish gray; loams and clay loams with clay increase from above horizons; weak medium prismatic to weak or moderate, medium subangular blocky structure; 0 to 30 percent angular gravel by volume; slightly hard to hard, friable to firm; slightly sticky to sticky, slightly plastic to plastic; pH range of 7.8 to 8; 8 to 18 inches thick. A calcareous layer starts at 6 to 10 inches within this zone and is 2 to 8 inches thick. A silica-cemented layer of 5 to 20 inches thick immediately lies below the calcareous layer.

MAPPING UNIT E2

Mapping unit E2 consists dominantly of landtype E2 and minor amounts of landtype E3 and C1. Landtype E2 is similar to landtype E3 with the exceptions of slope gradient and slope aspect.

Landtype E2 has deep soils derived from mixed eolian deposits including pumice and ash. Surface layers are moderately thick with loam textures. Subsoil layers are moderately thick with loam or sandy loam textures. A calcareous layer starts at depths ranging from 20 to 36 inches.

Bedrock is consolidated sediments and basalts usually at depths of 40 to 60 inches. These range from being incompetent to competent and from moderately hard to hard.

Typically, landtype E2 occurs on northerly aspects of moderately steep to steep slopes of basalt flow escarpments and upland sideslopes. Slope gradients range from 15 to 40 percent.

This landtype ranges in elevation from 2,100 to 3,300 feet and supports a sandy north exposure range site dominated by Idaho fescue.

The soil is excessively drained. Permeability is moderate in the surface soils and rapid in the subsoils.

Range of Profile Characteristics of Soil E2

Litter: Leaves, stems, and decomposing organic matter; less than 1 inch thick and scattered.

Surface Layers: Very dark grayish brown to dark brown; loams; weak medium platy and weak very fine granular at surface grading to weak coarse prismatic and subangular blocky structures with depth; 0 to 70 percent angular pumice pebbles by volume; loose to slightly hard, very friable to friable; slightly sticky, slightly plastic; pH range of 7.4 to 7.8; 17 to 27 inches thick. (A horizon thickness range of 7 to 12 inches.)

Subsoil Layers: Dark brown to brown; sandy loams and loams; massive; 0 to 10 percent angular pumice pebbles; soft to slightly hard, very friable; nonsticky, nonplastic; pH range of 8.5 to 9.2; 20 to 25+ inches thick. (A very strongly alkaline calcareous horizon starts at 10 to 15 inches within this zone.)

Soil Profile Notes: Pumice content ranges from 10 to 25 percent.

MAPPING UNIT E3

Mapping unit E3 consists dominantly of landtype E3 and minor amounts of landtypes E2, E6, and E4. Landtype E3 is similar to landtype E2 with the exception of slope gradients and slope aspect.

Landtype E3 has deep soils derived from mixed eolian deposits including pumice and ash. Surface layers are moderately thick with loam textures. Subsoil layers are moderately thick with loam or sandy loam textures. A calcareous layer starts at depths ranging from 20 to 36 inches.

Bedrock is consolidated sediments and basalts usually at depths of 40 to 60 inches. These range from being incompetent to competent and from moderately hard to hard.

Typically, landtype E3 occurs on all aspects of gentle slopes of basalt flow escarpments and upland sideslopes. Slope gradients range from 2 to 15 percent.

This landtype ranges in elevation from 2,100 to 3,300 feet and supports a sand hills range site dominated by bluebunch wheatgrass.

The soil is excessively drained. Permeability is moderate in the surface soils and rapid in the subsoils.

Range of Profile Characteristics of Soil E3

Litter: Leaves, stems, and decomposing organic matter; less than 1 inch thick and scattered.

Surface Layers: Very dark grayish brown to dark brown; loams; weak medium platy and weak very fine granular at surface grading to weak coarse prismatic and subangular blocky structures with depth; 0 to 70 percent angular pumice pebbles by volume; loose to slightly hard, very friable to friable; slightly sticky, slightly plastic; pH range of 7.4 to 7.8; 17 to 27 inches thick. (A horizon thickness range of 7 to 12 inches.)

Subsoil Layers: Dark brown to brown; sandy loams and loams; massive; 0 to 10 percent angular pumice pebbles; soft to slightly hard, very friable; nonsticky, nonplastic; pH range of 8.5 to 9.2; 20 to 25+ inches thick. (A very strongly alkaline calcareous horizon starts at 10 to 15 inches within this zone.)

Soil Profile Notes: Pumice content ranges from 10 to 25 percent.

MAPPING UNIT E4

Mapping unit E4 consists dominantly of landtype E4 and minor amounts of landtypes E8, E1, E6, and E3. Landtype E4 is similar to landtype E1, J3, and E8 with the exception of soils.

Landtype E4 has soils that are moderately deep to a silica-cemented hardpan layer (duripan). These soils are formed in moderately fine and fine textured colluvium of sedimentary origin. Surface layers are thin with loam or clay loam textures. Subsoil layers are thin to moderately thick with clay textures with cobble and gravel content ranging up to 30 percent by volume. The duripan lies at depths ranging normally from 20 to 30 inches.

Bedrock is semiconsolidated tuffaceous sedimentary rock lying below the duripan.

Typically, landtype E4 occurs on all aspects of nearly level to moderately steep upland sideslopes and terraces. Slope gradients generally are less than 20 percent.

This landtype ranges in elevation from 2,200 to 3,500 feet and supports a shrubby rolling hills range site dominated by bluebunch wheatgrass.

The soil is well drained. Permeability is moderate in the surface soils and slow to very slow in the subsoils.

Range of Profile Characteristics of Soil E4

Litter: Leaves, stems, and decomposing organic matter; less than 1 inch thick and scattered.

Surface Layers: Very dark grayish brown to dark brown; loams and clay loams; weak thin platy and weak fine granular structure at surface ranging to moderate fine and medium subangular blocky structure with depth; 20 to 30 percent angular gravels by volume; slightly hard to hard, friable to firm; slightly sticky to sticky, slightly plastic to plastic; pH range of 6.6 to 6.8; 6 to 16 inches thick. (A horizon thickness range of 6 to 10 inches.)

Subsoil Layers: Dark brown to dark yellowish brown; clays (thick clay films are common); strong, medium prismatic to moderate medium blocky structure; 20 to 30 percent angular cobbles and gravels by volume; very hard, very firm; very sticky, very plastic; pH range of 7.1 to 7.6; 4 to 16 inches thick. (A duripan - indurated silica-cemented gravelly hardpan - is reached usually at depths of 20 to 30 inches from the surface.)

MAPPING UNIT E5

Mapping unit E5 consists dominantly of landtype E5 and minor amounts of landtypes G7, E3, and J6. Landtype E5 is similar to landtype G7 with the exceptions of slope gradient and soil texture.

Landtype E5 has moderately deep soils derived from mixed clayey colluvium from sediments, tuffs, rhyolites, and basalts. Surface layers are thin with loam or silt loam textures. Subsoil layers are thin to moderately thick with clay or cobbly clay textures. The lower part of the subsoil is calcareous with segregated lime at depths of 20 to 40 inches.

Bedrock is incompetent, partially consolidated sediments at depths of 20 to 40 inches.

Typically, landtype E5 occurs on all aspects of gently sloping to steep upland sideslopes. Slope gradients range from 2 to 40 percent.

This landtype ranges in elevation from 3,500 to 4,500 feet and supports a south exposure range site dominated by bluebunch wheatgrass and a north exposure range site dominated by Idaho fescue.

The soil is well drained. Permeability is moderate in the surface soils and slow in the subsoils.

Range of Profile Characteristics of Soil E5

Litter: Leaves, stems, and decomposing organic matter; less than 1 inch thick and scattered.

Surface Layers: Dark gray; loams and silt loams; weak thin platy ranging to weak and moderate fine subangular blocky structure with depth; 15 to 25 percent cobbles and pebbles by volume; slightly hard to hard, friable; slightly sticky, slightly plastic; pH range of 6.6 to 6.8; 6 to 12 inches thick. (The A1 horizon corresponds to this range of depth.)

Subsoil Layers: Dark brown to dark or very dark grayish brown; clays; weak medium subangular blocky to moderate coarse prismatic structure; 10 to 50 percent angular cobble, gravel, very plastic; pH range of 7.4 to 8.0; 9 to 25 inches thick. Below this zone exists a calcareous layer that is dark brown; very cobbly loam; massive, 50 percent cobbles by volume, very hard, firm; very sticky, very plastic; pH of 8.0; 0-8 inches thick.

Soil Profile Notes: The mollic epipedum depth ranges from 20 to 28 inches thick.

MAPPING UNIT E6

Mapping unit E6 consists dominantly of landtype E6 and minor amounts of landtypes E1, E4, E8, and F1. Landtype E6 is similar to landtype E1 with the exception of soils.

Landtype E6 has moderately deep soils derived from old medium textured alluvium mixed with/or colluvium weathered from basalts. Surface layers are very thin to moderately thick loams. Subsoil layers are thin to moderately thick with clay loam to heavy loam textures. A calcareous layer lying just above bedrock is often present.

Bedrock is basalt at depths of 20 to 40 inches.

Typically, landtype E6 occurs on all aspects of nearly level to gently sloping upland sideslopes and old terraces. Slope gradients range from 2 to 15 percent.

This landtype ranges in elevation from 2,100 to 3,500 feet and supports an arid rolling hills range site dominated by bluebunch wheatgrass.

The soil is well drained. Permeability is moderate in the surface soils and slow in the subsoils.

Range of Profile Characteristics of Soil E6

Litter: Leaves, stems, and decomposing organic matter; less than 1 inch thick and scattered.

Surface Layers: Dark brown and dark to very dark grayish brown; loams; weak, very fine granular to weak, medium subangular blocky structure; 0 to 10 percent cobble, gravel, and stone by volume; soft, very friable to friable; slightly sticky, slightly plastic; pH range of 6.8 to 7.0; 4 to 20 inches thick. (The A1 horizon thickness ranges from 4 to 8 inches.)

Subsoil Layers: (2 distinct layers)

Upper Layer: Dark brown and dark to very dark grayish brown; loams and clay loams; weak to moderate, moderate to fine, subangular blocky structure; 0 to 25 percent angular cobble, gravels, and stones by volume; hard, firm; sticky, slightly plastic to plastic; pH 7.6; 8 to 20 inches thick.

Lower Layer: (Calcareous layer - discontinuous) dark yellowish brown; very cobbly clay loams; massive; 55 percent angular cobble, gravels, and stones by volume; pH of 8.2; 0 to 12 inches thick.

MAPPING UNIT E7

Mapping unit E7 consists dominantly of landtype E7 and minor amounts of landtypes E8, E2, E3, E4, and E1. Landtype E7 is similar to landtype E1 with the exceptions of landform and slope gradient.

Landtype E7 has moderately deep soils derived from loess mixed with colluvium. Surface layers are thin to moderately thick with loam textures. Subsoil layers are thin to moderately thick with clay loam or loam textures. Depth to an indurated duripan ranges from 20 to 30 inches. Gravel content can range up to 30 percent by volume. A thin calcareous layer lies above the duripan.

Bedrock is semiconsolidated tuffaceous sandstone at depths of 25 to 40 inches.

Typically, landtype E7 occurs on all aspects but primarily on southerly aspects of moderately steep to steep upland sideslopes. Slope gradients range from 15 to 40 percent.

This landtype ranges in elevation from 2,100 to 3,500 feet and supports a droughty south range site dominated by bluebunch wheatgrass.

The soil is well drained. Permeability is moderate in the surface soils and moderately slow in the subsoils.

Range of Profile Characteristics of Soil E7

Litter: Leaves, stems, and decomposing organic matter, less than 1 inch thick and scattered.

Surface Layers: Very dark grayish brown to dark brown; loams or sandy loams; weak to moderate, fine, granular structure to weak, medium, subangular blocky structure; 0-20 percent gravels by volume; slightly hard to hard; very friable to friable; slightly sticky, slightly plastic; pH range of 6.6 to 6.8; 6 to 20 inches thick. (A horizon thickness range of 6 to 14 inches.)

Subsoil Layers: Brown to light brownish gray; loams and clay loams with clay increase from above horizons; weak, medium, prismatic to weak or moderate, medium, subangular blocky structure; 0 to 30 percent angular gravel by volume; slightly hard to hard, friable to firm; slightly sticky to sticky, slightly plastic to plastic; pH range of 7.8 to 8; 8 to 18 inches thick. A calcareous layer starts at 6 to 10 inches within this zone and is 2 to 8 inches thick. A silica-cemented layer of 5 to 20 inches thick immediately lies below the calcareous layer.

MAPPING UNIT E8

Mapping unit E8 consists dominantly of landtype E8 and minor amounts of landtypes E4, E3, E6, and E1. Landtype E8 is similar to landtype E1 with the exceptions of soil and depth to bedrock.

Landtype E8 has shallow to moderately deep soils derived from mixed aeolian and sedimentary materials. Surface layers are very thin to thin loams. Subsoil layers are thin with heavy loam or clay loam textures. This soil contains no calcareous layer.

Bedrock is semiconsolidated tuffaceous sandstone at depths of 10 to 20 inches. It is moderately hard.

Typically, landtype E8 occurs on all aspects of nearly level to gently sloping upland undulating to rolling uplands. Slope gradients are less than 20 percent.

This landtype ranges in elevation from 3,200 to 3,500 feet and supports a shrubby rolling hills range site dominated by bluebunch wheatgrass.

The soil is well drained. Permeability is moderate in the surface soils and slow in the subsoils.

Range of Profile Characteristics of Soil E8

Litter: Leaves, stems, and decomposing organic matter, less than 1 inch thick and scattered.

Surface Layers: Very dark grayish brown; loams; weak, fine, granular to weak, fine, subangular blocky structure; 10 to 20 percent gravels and cobbles by volume; slightly hard, friable; slightly sticky, slightly plastic; pH range of 6.8 to 7.0 (neutral); 4 to 14 inches thick. (A1 horizon corresponds with this thick range.)

Subsoil Layers: Dark brown to dark yellowish brown; clay loams to heavy loams; weak to moderate, medium, subangular blocky structure; 10 to 20 percent gravels and cobbles by volume; hard, friable; sticky, plastic; pH of 7.0 (neutral); 6 to 14 inches thick.

MAPPING UNIT F1

Mapping unit F1 consists dominantly of landtype F1 and minor amounts of landtypes F2, E1, and E6. Landtype F1 is similar to landtype F2 with the exceptions of soils and landform. It occurs primarily on bottomland terrace rather than on alluvial fans.

Landtype F1 has deep to possibly very deep soils derived from geologically recent deposits of coarse and medium textured alluvial and eolian materials high in pumice and ash. Surface layers are thin to moderately thick with sandy loam, fine sandy loam, or loam textures. Subsoil layers are moderately thick to thick with sandy loam, fine sandy loam, or light loam textures. These are slightly hard and have silica and calcareous deposits.

Bedrock is composed of sedimentary and igneous rock. It ranges from 40 to 60 inches or more from the soil's surface.

Typically, landtype F1 occurs on all aspects of gently sloping, nearly level to concave shaped bottomland alluvial terraces and fans. Slope gradients are generally less than 15 percent.

This landtype ranges in elevation from 2,100 to 3,500 feet and supports a droughty bottomland fan range site dominated by bluebunch wheatgrass.

The soil is well drained. Permeability is rapid in the surface soils and moderate in the subsoils.

Range of Profile Characteristics of Soil F1

Litter: Leaves, stems, and decomposing organic matter; less than 1 inch thick and scattered.

Surface Layers: Very dark grayish brown to brown; sandy loams, fine sandy loams, and loams; weak thin platy near surface ranging to weak coarse prismatic breaking to weak fine subangular blocky structure. 0 to 10 percent gravel; slightly hard, friable; slightly sticky, slightly plastic; pH of 6.6 (neutral); 12 to 38 inches thick. (A1 horizon ranges in depth from 4 to 6 inches.)

Subsoil Layers: Grayish brown, brown to dark brown; sandy loams and loams; massive; 5 to 20 percent gravels by volume; slightly hard, friable; slightly sticky, slightly plastic; pH range of 7 to 8.2 (neutral to moderately alkaline); 20 to 41+ inches thick.

MAPPING UNIT F2

Mapping unit F2 consists dominantly of landtype F2 and minor amounts of landtypes F1, E1, E6, and E3. Landtype F2 is similar to landtype F1 with the exceptions of soils and landform or occurring primarily on alluvial fans rather than bottomland terraces.

Landtype F2 has very deep to extremely deep soils derived from geologically recent deposits of alluvium and eolian materials that include pumice and ash. Surface layers are thin to moderately thick. Subsoil layers are thick to very thick. The textures of these are stratified ranging from loams, fine sandy loams, or sandy loams to very gravelly loamy sands and very gravelly sands. A gravelly horizon that is pervious and strongly calcareous is reached at depths ranging from 20 to 40 inches.

Bedrock is composed of sedimentary and igneous rock. It occurs at depths greater than 60 inches.

Typically, landtype F2 occurs on all aspects of gentle sloping, nearly level to concaved shaped alluvial fans. Slope gradients are generally less than 8 percent.

This landtype ranges in elevation from 3,000 to 3,500 feet and supports a droughty bottomland fan range site dominated by bluebunch wheatgrass.

The soil is well drained. Permeability is moderate to rapid in the surface soils and rapid to very rapid in the subsoils.

Range of Profile Characteristics of Soil F2

Litter: Leaves, stems, and decomposing organic matter; less than 1 inch thick and scattered.

Surface Layers: Very dark grayish brown, brown to dark brown; fine sandy loams, sandy loams, and loams; weak, thin, platy to weak and moderate, fine and medium, subangular blocky structure; 0 to 20 percent gravels by volume; slightly hard, very friable to friable; slightly sticky, slightly plastic; pH range of 6.6 to 7.2 (neutral); 15 to 40 inches thick. (A1 horizon ranges in depths from 11 to 18 inches.)

Subsoil Layers: Brown to dark brown; very gravelly loamy sand to sand; massive; hard in places and loose when disturbed; 65 to 80 percent gravels and cobbles by volume; pH of 8.4 (moderately alkaline); 9 or more inches thick.

MAPPING UNIT G1

Mapping unit G1 consists dominantly of landtype G1 and minor amounts of landtypes G2, J5, and J3. Landtype G1 is similar to landtype G2 and G3 with the exception of slope aspects when compared to G2 and of slope aspects and slope gradients when compared to G3.

Landtype G1 has moderately deep to very deep soils derived from loess mixed with colluvium of fine textured sediments. Surface layers are very thin to thin with loam, clay loam, silt loam, or silty clay loam textures. Subsoil layers are thin to moderately thick with clay and silty clay loam textures. The lower portion of the soil is weakly to strongly calcareous. Gravel and cobble content in the upper 40 inches of soil can range up to 35 percent by volume.

Bedrock is old unconsolidated moderately fine to fine textured water-laid sediments at depths of 20 to 60 or more inches. It is soft and calcareous.

Typically, landtype G1 occurs on northerly aspects of gentle to moderately steep concave shaped upland slopes. Slope gradient generally ranges between 8 to 40 percent.

This landtype ranges in elevation from 2,500 to 3,500 feet and supports a droughty north exposure range site dominated by Idaho fescue.

The soil is well drained. Permeability is slow in the surface soils and very slow in the subsoils.

Range of Profile Characteristics of Soil G1

Litter: Leaves, stems, and decomposing organic matter; less than 1 inch thick and scattered.

Surface Layers: Very dark grayish brown and very dark brown; loams, silt loams, clay loams, and silty clay loams; moderate thin platy to weak and moderate, fine, subangular blocky structure; 0 to 35 percent cobbles and gravels by volume; slightly hard to hard, very friable to friable; slightly sticky to sticky, slightly plastic to plastic; pH of 6.8 (neutral); 4 to 10 inches thick. (A1 horizon corresponds with this depth range.)

Subsoil Layers: (2 distinct layers)

Upper Layer: Very dark brown to dark brown; clays (with clay films); weak medium prismatic and moderate fine blocky to medium subangular blocky structure; 0 to 35 percent cobbles and gravels by volume; very hard to hard, firm to very firm; very sticky, very plastic; pH range of 7.8 to 8.4 (mildly to moderately alkaline); 8 to 16 inches thick.

Lower Layer: Brown; silty clay loams; massive; hard, friable; sticky, plastic; pH of 8.4 (weakly to strongly calcareous); 15 or more inches and grades into underlying calcareous sediments.

MAPPING UNIT G2

Mapping unit G2 consists dominantly of landtype G2 and minor amounts of landtypes G1, J3, and J6. Landtype G2 is similar to landtypes G1 and G3 with the exception of slope aspects when compared to G1 and of slope gradients when compared to G3.

Landtype G2 has moderately deep to very deep soils derived from loess mixed with colluvium of fine textured sediments. Surface layers are very thin to thin with loam, clay loam, silt loam, or silty clay loam textures. Subsoil layers are thin to moderately thick with clay and silty clay loam textures. The lower portion of the soil is weakly to strongly calcareous. Gravel and cobble content in the upper 40 inches of soil can range up to 35 percent by volume.

Bedrock is old unconsolidated moderately fine to fine textured water-laid sediments at depths of 20 to 60 or more inches. It is soft and calcareous.

Typically, landtype G2 occurs on southerly aspects of gentle to moderately steep upland slopes. Slope gradients range between 10 to 30 percent.

This landtype ranges in elevation from 2,500 to 3,500 feet and supports a droughty south exposure site dominated by bluebunch wheatgrass.

The soil is well drained. Permeability is slow in the surface soils and very slow in the subsoils.

Range of Profile Characteristics of Soil G2

Litter: Leaves, stems, and decomposing organic matter; less than 1 inch thick and scattered.

Surface Layers: Very dark grayish brown and very dark brown; loams, silt loams, clay loams, and silty clay loams; moderate thin platy to weak and moderate, fine, subangular blocky structure; 0 to 35 percent cobbles and gravels by volume; slightly hard to hard, very friable to friable; slightly sticky to sticky, slightly plastic to plastic; pH of 6.8 (neutral); 4 to 10 inches thick. (A1 horizon corresponds with this depth range.)

Subsoil Layers: (2 distinct layers)

Upper Layer: Very dark brown to dark brown; clays (with clay films); weak medium prismatic and moderate fine blocky to medium subangular blocky structure; 0 to 35 percent cobbles and gravels by volume; very hard to hard, firm to very firm; very sticky, very plastic; pH range of 7.8 to 8.4 (mildly to moderately alkaline); 8 to 16 inches thick.

Lower Layer: Brown; silty clay loams; massive; hard, friable; sticky, plastic; pH of 8.4 (weakly to strongly calcareous); 15 or more inches and grades into underlying calcareous sediments.

MAPPING UNIT G3

Mapping unit G3 consists dominantly of landtype G3 and minor amounts of landtypes G2, G1, J5, and J6. Landtype G3 is similar to landtypes G1 and G2 with the exception of slope gradients when compared to G2 and of slope aspects and slope gradients when compared to G1.

Landtype G3 has moderately deep to very deep soils derived from loess mixed with colluvium of fine textured sediments. Surface layers are very thin to thin with loam, clay loam, silt loam, or silty clay loam textures. Subsoil layers are thin to moderately thick with clay and silty clay loam textures. The lower portion of the soil is weakly to strongly calcareous. Gravel and cobble content in the upper 40 inches of soil can range up to 35 percent by volume.

Bedrock is old unconsolidated moderately fine to fine textured water-laid sediments at depths of 20 to 60 or more inches. It is soft and calcareous.

Typically, landtype G3 occurs on southerly aspects of steep to very steep upland slopes. Slope gradients range between 30 to 70 percent.

This landtype ranges in elevation from 2,500 to 3,500 feet and supports a droughty steep south range site dominated by bluebunch wheatgrass.

The soil is well drained. Permeability is slow in the surface soils and very slow in the subsoils.

Range of Profile Characteristics of Soil G3

Litter: Leaves, stems, and decomposing organic matter; less than 1 inch thick and scattered.

Surface Layers: Very dark grayish brown and very dark brown; loams, silt loams, clay loams, and silty clay loams; moderate thin platy to weak and moderate, fine, subangular blocky structure; 0 to 35 percent cobbles and gravels by volume; slightly hard to hard, very friable to friable; slightly sticky to sticky, slightly plastic to plastic; pH range of 6.8 (neutral); 4 to 10 inches thick. (A1 horizon corresponds with this depth range.)

Subsoil Layers: (2 distinct layers)

Upper Layer: Very dark brown to dark brown; clays (with clay films); weak medium prismatic and moderate fine blocky to medium subangular blocky structure; 0 to 35 percent cobbles and gravels by volume; very hard to hard, firm to very firm; very sticky, very plastic; pH range of 7.8 to 8.4 (mildly to moderately alkaline); 8 to 16 inches thick.

Lower Layer: Brown; silty clay loams; massive; hard, friable; sticky, plastic; pH range of 8.4 (weakly to strongly calcareous); 15 or more inches and grades into underlying calcareous sediments.

MAPPING UNIT G7

Mapping unit G7 consists dominantly of landtype G7 and minor amounts of landtypes J6, J5, G1, and E5. Landtype G7 is similar to landtype E5 with the exceptions of slope gradient and soil texture.

Landtype G7 has moderately deep to very deep soils formed in loess over mixed medium and moderately coarse textured old alluvial or colluvial materials of sedimentary and igneous origin. Surface layers are moderately thick to thick with silt loam to silty clay loams. The subsoil layers are moderately thick to thick with silt loam, loam, to very fine sandy loam textures. Gravel content can range up to 30 percent by volume in the upper 40 inches and up to 60 percent below the depth of 40 inches in these soils.

Bedrock is sedimentary or igneous. It is variable in hardness and competency. Depth to bedrock ranges from 30 to over 60 inches.

Typically, landtype G7 occurs on northerly aspects of steep to very steep upland slopes. Slope gradients range between 30 to 70 percent.

This landtype ranges in elevation from 3,000 to 5,100 feet and supports a steep north range site dominated by Idaho fescue.

The soil is well drained. Permeability is moderate in the surface soils and moderate in the subsoils.

Range of Profile Characteristics of Soil G7

Litter: Leaves, stems, and decomposing organic matter; less than 1 inch thick and scattered.

Surface Layers: Dark gray to dark brown; silt loams to silty clay loams; weak, fine, granular to weak and moderate, fine and medium, subangular blocky structure; 0 to 40 percent gravels by volumes; slightly hard to hard, very friable to friable; slightly sticky to sticky, slightly plastic; pH of 6.6 to 7.0 (neutral); 30 to 43 inches thick. (A1 horizon depths ranges from 8 to 16 inches thick.)

Subsoil Layers: Brown; silt loams, very fine sandy loams to loams; massive; 10 to 60 percent gravels; slightly hard, very friable; slightly sticky, slightly plastic; pH range of 7.6 to 8.2 (mildly to moderately alkaline); 20 to 30 and more inches thick.

MAPPING UNIT H2

Mapping unit H2 consists dominantly of landtype H2 and minor amounts of landtypes H3, J1, and J0. Landtype H2 is similar to landtype H3 with the exception of slope gradients.

Landtype H2 has shallow soils formed in stony colluvium consisting of a mixture of loess and residuum weathered from underlying basalts. The surface soil layers are thin with nongravelly to gravelly textures of loam, silt loam, or sandy loam. The subsoil layers are very thin to thin with gravelly to very gravelly textures of silt loam, loam, sandy clay loam, silty clay loam, or clay loam.

Bedrock is fractured to massive basalt at depths ranging from 15 to 20 inches. In places, clay films coat the fractures in the basalt.

Typically, landtype H2 occurs on southerly aspects of gentle to moderately steep upland and mountain sideslopes. Slope gradients range from 2 to 30 percent.

This landtype ranges in elevation from 3,000 to 4,500 feet and supports a droughty south exposure range site dominated by bluebunch wheatgrass.

The soil is well drained. Permeability is moderate in the surface soils and moderate in the subsoils.

Range of Profile Characteristics of Soil H2

Litter: Leaves, stems, and decomposing organic matter; less than 1 inch thick and scattered.

Surface Layers: Very dark grayish brown and dark to very dark brown; silt loams, loams, and sandy loams; weak, fine, granular grading with depth to weak and moderate, fine and medium, subangular blocky structure; 5 to 50 percent angular gravels and cobbles by volume; slightly hard, friable; slightly sticky, slightly plastic; pH range of 6.9 to 7.2 (neutral); 7 to 15 inches thick. (A1 horizon ranges from 3 to 8 inches thick.)

Subsoil Layers: Dark brown to dark yellowish brown; silt loams, loams, sandy clay loams, silty clay loams, and clay loams; moderate, medium and fine, subangular blocky structure; 40 to 85 percent angular gravels and cobbles by volume; hard, friable to firm; sticky, plastic; pH range of 6.6 to 6.8 (neutral); 5 to 12 inches thick.

MAPPING UNIT H3

Mapping unit H3 consists dominantly of landtype H3 and minor amounts of landtypes H2 and J6. Landtype H3 is similar to landtype H2 with the exception of slope gradients.

Landtype H3 has shallow soils formed in stony colluvium consisting of a mixture of loess and residuum weathered from underlying basalts. The surface soil layers are thin with nongravelly to gravelly textures of loam, silt loam, or sandy loam. The subsoil layers are very thin to thin with gravelly to very gravelly textures of silt loam, loam, sandy clay loam, silty clay loam, or clay loam.

Bedrock is fractured to massive basalt at depths ranging from 15 to 20 inches. In places, clay films coat the fractures in the basalt.

Typically, landtype H3 occurs on southerly aspects of steep to very steep upland and mountain sideslopes. Slope gradients range from 30 to 70 percent.

This landtype ranges in elevation from 3,000 to 4,500 feet and supports a droughty steep south range site dominated by bluebunch wheatgrass.

The soil is well drained. Permeability is moderate in the surface soils and moderate in the subsoils.

Range of Profile Characteristics of Soil H3

Litter: Leaves, stems, and decomposing organic matter; less than 1 inch thick and scattered.

Surface Layers: Very dark grayish brown and dark to very dark brown; silt loams, loams, and sandy loams; weak, fine, granular grading with depth to weak and moderate, fine and medium, subangular blocky structure; 5 to 50 percent angular gravels and cobbles by volume; slightly hard, friable; slightly sticky, slightly plastic; pH range of 6.9 to 7.2 (neutral); 7 to 15 inches thick. (A1 horizon ranges from 3 to 8 inches thick.)

Subsoil Layers: Dark brown to dark yellowish brown; silt loams, loams, sandy loams, silty clay loams, and clay loams; moderate, medium and fine, subangular blocky structure; 40 to 85 percent angular gravels and cobbles by volume; hard, friable to firm; sticky, plastic; pH range of 6.6 to 6.8 (neutral); 5 to 12 inches thick.

MAPPING UNIT J0

This is a miscellaneous mapping unit occurring on all aspects as exposed rockland or well drained, very shallow stony soils on nearly level to gentle sloping lava flow plains. Slopes usually are less than 15 percent. Vegetation is very sparse consisting of scabland types. Dominant vegetation consists of Sandberg bluegrass, one-spike oatgrass, bighead clover, biscuitroots, and stiff sagebrush. Elevation ranges from 2,800 to 3,200 feet. Depth to bedrock is less than 4 inches.

MAPPING UNIT J1

Mapping unit J1 consists dominantly of landtype J1 and minor amounts of landtypes J0, E6, D1, E1, and E8. Landtype J1 is similar to landtype H2 with the exception of soil depth. H2 soils range from 12 to 20 inches deep.

Landtype J1 has very shallow to shallow soils formed in loess, old alluvium, and residuum weathered from basalt. Surface layers are very thin with loam textures. Subsoil layers are very thin to thin with loam, clay loam, or sandy loam textures. The surface and subsoil textures are stony or cobbly to very stony or very cobbly with these rock fragments ranging from 50 to 90 percent by volume.

Bedrock is hard, competent basalt at depths ranging from 4 to 12 inches. It is fractured and, in places, clay films are lining the fractures.

Typically, landtype J1 occurs on all aspects of nearly level to moderately steep upland sideslopes. Slope gradients range from 2 to 20 percent but mostly are less than 10 percent.

This landtype ranges in elevation from 2,500 to 3,600 feet and supports a scabland range site dominated by Sandberg bluegrass and stiff sagebrush.

The soil is well drained. Permeability is moderate in the surface soils and moderate to slow in the subsoils.

Range of Profile Characteristics of Soil J1

Litter: Leaves, stems, and decomposing organic matter; less than 1 inch thick and very sparsely scattered.

Surface Layers: Dark brown, dark to very dark grayish brown; loams; weak, thin, platy to weak, fine, subangular blocky structure; 40 to 60 percent angular gravels, cobbles, and stones by volume; slightly hard, friable; slightly sticky to sticky, slightly plastic to plastic; pH range of 6.5 to 6.8 (slightly acid to neutral); 2 to 9 inches thick. (A1 horizon depth ranges from 0 to 3 inches.)

Subsoil Layers: Dark brown to dark yellowish brown; loams, clay loams, and sandy clay loams; weak to moderate, fine to medium, subangular blocky structure; 50 to 90 percent angular gravels, cobbles, and stones by volume; hard, friable; sticky, plastic; pH of 6.9 (neutral); 1 to 4 inches thick.

MAPPING UNIT J2

This is a miscellaneous mapping unit occurring on all aspects as rough and broken land. Slope gradients generally range from 30 to 70 percent. Rock outcrops, cliffs, and talus slopes are common. Bedrock consists of sediments, tuffs, and basalts. Vegetation consists of sagebrush, bunchgrasses, rabbitbrush, bitterbrush, and associated forbs. Juniper are common with scattered ponderosa pine in isolated small areas. Elevation ranges from 2,100 to 4,500 feet. Soils are well drained and stony. Depth to bedrock is variable and can range from exposed rock to over 144 inches.

MAPPING UNIT J3

Mapping unit J3 consists dominantly of landtype J3 and minor amounts of landtypes G2, E4, E8, and H2. Landtype J3 is similar to landtype E4 with the exception of soils.

Landtype J3 has soils that are moderately deep to a duripan layer (a gravelly and cobbly silica-cemented horizon). Surface layers are thin with cobbly and gravelly textures of clay loam, silt loam, or loam. Subsurface layers are thin to moderately thick with cobbly to very cobbly textures of clay, silty clay, or clay loam. Depth to a duripan layer ranges from 20 to 40 inches.

Bedrock is rhyolite and/or basalt underlying a duripan layer.

Typically, landtype J3 occurs on all aspects of gentle to moderately steep upland sideslopes. Slope gradients are usually less than 20 percent.

This landtype ranges in elevation from 3,300 to 3,900 feet and supports a shrubby rolling hills range site dominated by bluebunch wheatgrass.

The soil is well drained. Permeability is slow in the surface soils and slow to very slow in the subsoils.

Range of Profile Characteristics of Soil J3

Litter: Leaves, stems, and decomposed organic matter; less than 1 inch thick and scattered.

Surface Layers: Black to very dark gray; clay loams, silt loams, and loams; weak, thin, platy, to moderate, very fine and fine, subangular blocky structure; 35 to 50 percent angular cobbles and gravels by volume; slightly hard to hard, friable; slightly sticky to sticky, slightly plastic to plastic; pH range of 6.4 to 6.6 (slightly acid to neutral); 7 to 14 inches thick. (A1 horizon corresponds with this depth range.)

Subsoil Layers: (2 distinct layers)

Upper Layer: Very dark to dark grayish brown, brown to dark brown; clays; moderate and strong, medium, subangular blocky to blocky structure; 35 to 60 percent angular cobbles and gravels by volume; extremely hard, friable; sticky to very sticky, plastic to very plastic; pH range of 6.6 to 7.8 (neutral to mildly alkaline); 10 to 30 inches thick.

Lower Layer: Grayish brown, dark grayish brown, brown to yellowish brown; clay loams to loams; massive; 50 to 65 percent angular cobbles and gravels by volume; very hard, very firm; sticky, plastic; pH of 8.0 (mildly alkaline); 3 to 8 inches thick. (This layer is underlain by a silica-cemented gravelly, cobbly duripan.)

MAPPING UNIT J5

Mapping unit J5 consists dominantly of landtype J5 and minor amounts of landtypes J6, G3, and G7. Landtype J5 is similar to landtype J6 with the exception of soil development.

Landtype J5 has moderately deep to very deep soil formed in loess over colluvial materials that are a mixture of fine sediment with basalt fragments. Surface layers are thin to moderately thick with silt loam textures. Subsoil layers are thin to moderately thick with gravelly to very gravelly textures of silty clay loam to silt loam.

Bedrock is soft to moderately hard fine textured sediments at depths ranging from 20 to 60 or more inches from the soil surface.

Typically, landtype J5 occurs on southerly aspects of steep to very steep upland and mountain sideslopes. Slope gradients range from 30 to 70 percent.

This landtype ranges in elevation from 3,500 to 5,100 feet and supports a steep south range site dominated by bluebunch wheatgrass.

The soil is well drained. Permeability is moderate in the surface soils and moderate to slow in the subsoils.

Range of Profile Characteristics of Soil J5

Litter: Leaves, stems, and decomposing organic matter; less than 1 inch thick and scattered.

Surface Layers: Dark brown to black; silt loams; weak, medium, platy to weak and moderate, fine and medium, subangular blocky structure; 5 to 40 percent angular gravels, cobbles, and stones by volume; soft to hard, very friable to friable; slightly sticky to sticky, slightly plastic to plastic; pH range of 6.0 to 6.2 (medium to slightly acid); 14 to 32 inches thick. (A1 horizon depth ranges from 12 to 15 inches.)

Subsoil Layers: Dark brown to yellowish brown; silty clay loams and silt loams; moderate, medium, subangular blocky structure; 50 to 80 percent cobbles, gravels, and stones by volume; hard, firm; sticky, plastic; pH of 6.2 (slightly acid); 6 to 20 inches thick. (Weathered, olive to olive brown, clayey sediments underlie these subsoils.)

MAPPING UNIT J6

Mapping unit J6 consists dominantly of landtype J6 and minor amounts of landtypes H3, G7, J5, and E4. Landtype J6 is similar to landtype J7 with the exception of soil development.

Landtype J6 has moderately deep soils formed in gravelly and cobbly colluvial materials. The surface layers are thin with nongravelly to gravelly textures of loam or sandy loam. Subsoil layers are thin to moderately thick with very gravelly textures of heavy loam, clay loam, or silty clay loam. Gravel and cobble content in the surface layer range from 20 to 50 percent by volume and in the lower layers range from 50 to 80 percent.

Bedrock is fractured rhyolite at depths of 20 to 40 inches. Clay films are common and moderately thick on the fracture surfaces.

Typically, landtype J6 occurs on southerly aspects of steep to very steep upland and mountain sideslopes. Slope gradients range from 30 to 70 percent.

This landtype ranges in elevation from 3,000 to 4,500 feet and supports a juniper south exposure range site dominated by bluebunch wheatgrass and Thurber needlegrass.

The soil is well drained. Permeability is moderate in the surface soils and moderate to slow in the subsoils.

Range of Profile Characteristics of Soil J6

Litter: Leaves, stems, and decomposing organic matter; less than 1 inch thick and scattered.

Surface Layers: Very dark grayish brown, dark to very dark brown; loams to sandy loams; weak, moderate, platy, granular, and subangular blocky structure; 20 to 50 percent angular gravels, cobbles, and stones; soft to slightly hard, very friable to friable; slightly sticky, slightly plastic; pH range of 6.8 to 7.0 (neutral); 8 to 14 inches thick. (A1 horizon ranges in depth from 2 to 8 inches.)

Subsoil Layers: Dark brown to yellowish brown; clay loams, silty clay loams, and loams; weak, fine to medium, prismatic to subangular blocky grading with depth to massive structure; 50 to 80 percent angular gravels, cobbles, and stones by volume; hard, firm, sticky, plastic grading to slightly hard, friable, slightly sticky, plastic just above bedrock; pH of 7.2 (neutral); 12 to 26 inches thick.

MAPPING UNIT L1

Mapping unit L1 consists dominantly of landtype L1 and minor amounts of landtypes L2, L3, T2, and T3. Landtype L1 is similar to landtype L2 with the exception of soil texture and topographic features.

Landtype L1 has deep to extremely deep soils derived from ash overlying or mixed with landslide debris consisting of an assortment of clayey tuffaceous sediments and harder volcanic rock fragments. Surface soils are very thin to moderately thick, nongravelly to very gravelly textures of loamy sands, sandy loams, loams, and silt loams. Subsoils are moderatley thick to very thick, gravelly and cobbly to very gravelly and cobbly textures of silty clay loams, silty clays, and clays.

Bedrock is buried below landslide debris and consists of soft tuffaceous rock or large blocks (up to many acres in size) of harder basalts and andesites scattered within this landslide debris. Depth to consolidated bedrock ranges from 40 to over 144 inches.

Typically, landtype L1 occurs on narrow hummocky ridges within a larger rolling, benchy landslide topography. Slopes are all aspects and are short with straight to convex shaped profiles. Gradients commonly range from 20 to 50 percent with some up to 70 percent.

This landtype ranges in elevation from 4,500 to 5,500 feet and supports community types of mixed conifer - pinegrass, residual soils, and mixed conifer - pinegrass, ash soils in mixed conifer overstory stages. Site class 5 for Douglas-fir. Site class 4 for ponderosa pine.

The soil is well drained. Permeability is rapid in the surface soils and moderate to slow in the subsoils.

Range of Profile Characteristics of Soil L1

Litter: Needles, leaves, twigs, and decomposing organic matter; 1 to 2 inches thick.

Surface Layers: Dark brown to brown; loamy sands, sandy loams, loams, and silt loams; weak, very fine, subangular blocky structure to single grained; 10 to 60 percent subround gravels, cobbles, and stones by volume; nonsticky, nonplastic to slightly plastic; pH 6.5 to 7.0; 2 to 36 inches thick.

Subsoil Layers: Dark brown, dark reddish brown to yellowish brown; silty clay loams, silty clays, and clays; massive to strong, very fine to medium, subangular blocky structure; 35 to 80 percent subround gravels, cobbles, and stones by volume; pH 6.0 to 7.0; 30 to over 144 inches thick.

MAPPING UNIT L2

Mapping unit L2 consists dominantly of landtype L2 and minor amounts of landtypes L6, L3, L1, and L5. Landtype L2 is similar to landtype T2 with the exceptions of geologic units and often soil depth.

Landtype L2 has deep to extremely deep soils derived from ash overlying landslide debris consisting of an assortment of clayey tuffaceous sediments and harder volcanic rock fragments. Surface soils are thin to moderately thick loamy sands, sandy loams, loams, and silt loams. Subsoils are moderately thick to very thick nongravelly to gravelly textures of silty clay loams, silty clays, and clays.

Bedrock is buried below landslide debris and consists of soft tuffaceous rock or large blocks (up to many acres in size) of harder basalts and andesites scattered within this landslide debris. Depth to consolidated bedrock ranges from 40 to over 144 inches.

Typically, landtype L2 occurs on northerly aspects of gentle to steep slopes of rolling to benchy topography. Slope gradients range from 2 to 50 percent but commonly are less than 30 percent.

This landtype ranges in elevation from 4,500 to 6,000 feet and supports community types of mixed conifer - pinegrass, ash soils in mixed conifer overstory stages. Site class 5 Douglas-fir. Site class 3 ponderosa pine.

The soil is well drained. Permeability is rapid in the surface soils and slow to very slow in the subsoils.

Range of Profile Characteristics of Soil L2

Litter: Needles, leaves, twigs, and decomposing organic matter. 1 to 2 inches thick.

Surface Layers: Very dark grayish brown, dark reddish brown to yellowish brown; loamy sands, sandy loams, and loams to silt loams (slightly mixed to recent ash); weak, very fine, subangular blocky to single grained structure; 10 to 25 percent pebbles and larger gravels and cobbles by volume; nonsticky, nonplastic to slightly plastic; pH ranges from 6.3 to 7.0; 6 to 24 inches thick.

Subsoil Layers: Reddish brown to dark yellowish brown; silty clay loams, silty clays, and clays; massive to strong, very fine to medium, subangular blocky structure; 10 to 50 percent subround gravels, cobbles, and stones by volume; sticky to very sticky, plastic to very plastic; pH ranges from 6.7 to 7.0; 30 to over 144 inches thick.

MAPPING UNIT L3

Mapping unit L3 consists dominantly of landtype L3 and minor amounts of landtypes L1, L8, and L2. Landtype L3 is similar to landtype L8 with the exceptions of vegetation and soil.

Landtype L3 has deep to extremely deep soils derived from mixed ash and loess overlying landslide debris consisting of an assortment of clayey tuffaceous sediments and harder volcanic rock fragments. Surface soils are very thin to thin, silty clay loams, loams, and silt loams. Subsoils are moderately thick to extremely thick, nongravelly to gravelly textures of silty clay loams, silty clays, and clays.

Bedrock is buried below landslide debris and consists of soft tuffaceous rock or large blocks (up to many acres in size) of harder basalts scattered within this landslide debris. Depth to consolidated bedrock ranges from 40 to over 144 inches.

Typically, landtype L3 occurs on southerly aspects of gentle to steep slopes on rolling to benchy topography. Slope gradients range from 2 to 50 percent, but commonly are less than 30 percent.

This landtype ranges in elevation from 4,500 to 6,000 feet and supports ponderosa pine - fescue, ponderosa pine - elk sedge, and mixed conifer - pinegrass, residual soils in pine dominated overstory stages.

The soil is well drained. Permeability is moderate in the surface soils and slow to very slow in the subsoils.

Range of Profile Characteristics of Soil L3

Litter: Needles, leaves, twigs, and decomposing organic matter; 1 to 3 inches thick.

Surface Layers: Very dark brown to very dark grayish brown; silty clay loams, loams, and silt loams (up to 6 inches of recent ash in places); weak to moderate, very fine, subangular blocky structure; 0 to 30 percent subround gravels and cobbles by volume; nonsticky to slightly sticky, slightly plastic; pH 5.8 to 7.0; 10 to 18 inches thick.

Subsoil Layers: Strong brown, reddish brown to yellowish brown, silty clay loams, silty clays, and clays; weak to strong, very fine to fine, subangular blocky structure; 10 to 50 percent subround gravels, cobbles, and stones by volume; pH 6.8 to 7.5; 30 to over 144 inches thick.

MAPPING UNIT L5

Mapping unit L5 consists dominantly of landtype L5 and minor amounts of landtypes L6 and L2. Landtype L5 is similar to landtype L6 with the exception of landform position and vegetation.

Landtype L5 has deep to extremely deep soils derived from volcanic ash overlying landslide debris consisting of an assortment of clayey tuffaceous sediments and harder volcanic rock fragments. Surface soils are moderately thich ash with loam, sandy loam, loamy sand, and silt loam textures. Subsoils are moderately thick to very thick, nongravelly to gravelly textures of silty clay loams, silty clays, and clays.

Bedrock is buried below landslide debris and consists of soft tuffaceous rock and large blocks (up to many acres in size) of harder basalts and andesites scattered within this landslide debris. Depth to consolidated bedrock ranges from 40 to over 144 inches.

Typically, landtype L5 occurs on all aspects of broad flats and depressional areas within larger units of landslide topography. Slope gradients are generally less than 10 percent but may reach 30 percent.

This landtype ranges in elevation from 4,800 to 6,000 feet and supports the community type of lodgepole pine - pinegrass - grouse huckleberry.

The soil is well drained. Permeability is rapid in the surface soils and slow to very slow in the subsoils.

Range of Profile Characteristics of Soil L5

Litter: Needles, leaves, twigs, and decomposing organic matter; 1 to 2 inches thick.

Surface Layers: Brown to yellowish brown and grayish brown to light gray; loams, sandy loams, loamy sands, and silt loams of recent volcanic ash; single grained to weak, very fine, subangular blocky structure; 5 to 15 percent very fine, angular pumice gravels by volume; nonsticky, nonplastic; pH range of 6.0 to 7.5; 20 to 36 inches thick.

Subsoil Layers: Reddish brown, dark reddish brown to dark yellowish brown; silty clay loams, silty clays, and clays; moderate to strong, very fine, subangular blocky structure grading to massive with depth; 10 to 50 angular to subround gravels, cobbles, and stones by volume; sticky to very sticky, plastic to very plastic; pH of 6.7 to 7.0; 20 to over 144 inches thick.

MAPPING UNIT L6

Mapping unit L6 consists dominantly of landtype L6 and minor amounts of landtypes L2, L5, L1, and L3. Landtype L6 is similar to landtype L2 with the exception of vegetation and ash surface thickness.

Landtype L6 has deep to extremely deep soils derived from volcanic ash overlying landslide debris consisting of an assortment of clayey tuffaceous sediments and harder volcanic rock fragments. Surface soils are moderately thick ash with loamy sand, loam, sandy loam, and silt loam textures. Subsoils are moderately thick to very thick, nongravelly to gravelly textures of silty clay loams, silty clays, and clays.

Bedrock is buried below landslide debris and consists of soft tuffaceous rock and large blocks (up to many acres in size) of harder basalts and andesites scattered within this landslide debris. Depth to consolidated bedrock ranges from 50 to over 144 inches.

Typically, landtype L6 occurs on northerly aspects of gentle to steep slopes of rolling to benchy topography. Slope gradients range from 2 to 50 percent but commonly are less than 30 percent.

This landtype ranges in elevation from 4,500 to 6,000 feet and supports community types of white fir - twinflower - forb and mixed conifer - pinegrass, ash soils in fir dominated overstory stages.

The soil is well drained. Permeability is rapid in the surface soils and slow to very slow in the subsoils.

Range of Profile Characteristics of Soil L6

Litter: Needles, twigs, leaves, and decomposing organic matter. 1 to 2 inches thick.

Surface Layers: Very dark grayish brown, dark brown, to yellowish brown; loamy sands, loams, and sandy loams to silt loams of recent volcanic ash; single grained to weak, very fine, subangular blocky structure; 5 to 20 percent angular to subround gravels, cobbles, and stones by volume; nonsticky, nonplastic; pH ranges from 6.7 to 7.5; 18 to 36 inches thick.

Subsoil Layers: Reddish brown to dark yellowish brown; silty clay loams, silty clays, and clays; massive to strong, very fine to medium, subangular blocky structure; 10 to 50 percent subround gravels, cobbles, and stones by volume; sticky to very sticky, plastic to very plastic; pH ranges from 6.7 to 7.0; 30 to over 144 inches thick.

MAPPING UNIT L7

Mapping unit L7 consists dominantly of landtype L7 and minor amounts of landtypes L2, L6, and L3. Landtype L7 is similar to landtype L3 with the exception of soil drainage and landform.

Landtype L7 has deep to extremely deep soils, developed in mixtures of ash, loess, and residual of landslide debris. Surface layers are very thin to thin, heavy silt loams and clay loams (occasionally very thin layers of ash blanket this soil). Subsoil layers are thick to very thick silty clays and clays.

Bedrock is underlying landslide debris. It usually consists of soft tuffaceous rocks or blocks (up to many acres in size) of harder basalts and andesites scattered within this landslide debris. Depth to consolidated bedrock ranges from 40 to over 144 inches.

Typically, landtype L7 occurs on all aspects on gentle slopes in depressional areas of larger landslide debris. Slopes are less than 20 percent.

This landtype ranges in elevation from 4,500 to 5,500 feet and supports community types of mixed conifer - pinegrass, residual soils, and ponderosa pine - elk sedge in pine dominated overstory stages.

The soil is somewhat poorly drained. Permeability is moderate to moderately slow in the surface soils and very slow in the subsoils.

Range of Profile Characteristics of Soil L7

Litter: Needles, twigs, and decomposing organic matter; 1 to 2 inches thick.

Surface Layers: Dark brown to very dark brown; silt loams, silty clay loams, and clay loams; strong fine crumb, moderate very fine platy, to moderate, very fine, fine, and medium subangular blocky structure; 0 to 10 percent gravels and cobbles by volume; sticky to very sticky, plastic to very plastic; pH ranges from 6.6 to 8.0; 5 to 15 inches thick.

Subsoil Layers: Light gray, very dark grayish brown to light yellowish brown; silty clay to clay; moderate to strong, very fine to fine subangular blocky structure becoming massive with depth; 0 to 15 percent platy gravels and cobbles by volume; sticky, plastic to very plastic; pH ranges from 7.5 to 8.0; generally over 60 inches thick.

MAPPING UNIT L8

Mapping unit L8 consists dominantly of landtype L8 and minor amounts of landtypes L3, L2, L1, and L6. Landtype L8 is similar to landtype L2 with the exception of slope aspect.

Landtype L8 has deep to extremely deep soils derived for ash overlying landslide debris consisting of an assortment of clayey tuffaceous sediments and harder volcanic rock fragments. Surface soils are thin to moderately thick loamy sands, sandy loams, loams, and silt loams. Subsoils are moderately thick to very thick, nongravelly to gravelly textures of silty clay loams, silty clays, and clays.

Bedrock is buried below landslide debris and consists of soft tuffaceous rock or large blocks (up to many acres in size) of harder basalts and andesites scattered within this landslide debris. Depth to bedrock ranges from 40 inches to over 144 inches.

Typically, landtype L8 occurs on northerly aspects of gentle to steep slopes of rolling to benchy topography. Slope gradients range from 2 to 50 percent but commonly are less than 30 percent.

This landtype ranges in elevation from 5,500 to 6,000 feet and supports the community type of mixed conifer - pinegrass, ash soils in mixed conifer overstory stages. Site class 5 - Douglas-fir. Site class 3 - ponderosa pine.

The soil is well drained. Permeability is rapid in the surface soils and slow to very slow in the subsoils.

Range of Profile Characteristics of Soil L8

Litter: Needles, leaves, twigs, and decomposing organic matter. 1 to 2 inches thick.

Surface Layers: Very dark grayish brown, dark reddish brown to yellowish brown; loamy sands, sandy loams, and loams to silt loams (slightly mixed to recent ash); weak, very fine, subangular blocky to single grained structure; 10 to 25 percent pebbles and larger gravels and cobbles by volume; nonsticky, nonplastic to slightly plastic; pH ranges from 6.3 to 7.0; 6 to 24 inches thick.

Subsoil Layers: Reddish brown to dark yellowish brown; silty clay loams, silty clays, and clays; massive to strong, very fine to medium, subangular blocky structure; 10 to 50 percent subround gravels, cobbles, and stones by volume; sticky to very sticky, plastic to very plastic; pH ranges from 6.7 to 7.0; 30 to over 144 inches thick.

MAPPING UNIT M1

This is a miscellaneous mapping unit occurring on all aspects as wet and moist meadow sites underlain by Columbia River basalts. Landforms consist primarily of broad gentle sloping depressional areas. Slopes are usually less than 10 percent. Vegetation varies from wet through moist meadow types consisting of grasses, sedges, and forbs. Elevation ranges from 4,500 to 6,000 feet. Soils are variable in texture. They are usually poorly to moderately well drained. Depth to bedrock normally ranges from 20 to 60 inches.

MAPPING UNIT M2

This is a miscellaneous mapping unit occurring as wet to dry meadows underlain by Clarno and John Day formation sediments. Landforms vary from broad, gentle benches to depressional pockets and mountain slopes with soils slowly creeping and slumping downslope. Slope gradients range from 2 to 30 percent. Vegetation varies from wet through dry meadow types consisting of grass, sedges, and forbs. Elevation ranges from 4,500 to 6,000 feet. Soils are variable in texture. They range from poorly to well drained. Depth to bedrock is variable but ranges from 40 to over 144 inches.

MAPPING UNIT M3

This is a miscellaneous mapping unit occurring on all aspects as dry meadows underlain by Columbia River basalts. Landform consists primarily of upper slopes of broad, gentle, sloping, depressional areas. Slopes are generally less than 10 percent. Vegetation consists of the dry meadow type consisting of tufted hairgrass, Kentucky bluegrass, California oatgrass, and various forbs. Elevation ranges from 4,500 to 6,000 feet. Soils vary in texture, and depth to bedrock normally ranges from 20 to 60 inches. They are moderately well to well drained.

MAPPING UNIT M8

This is a miscellaneous mapping unit occurring on all aspects as wet, moist, and dry meadow sites underlain by rhyolite bedrock. Landforms consist of gentle, sloping, depressional areas in mountain upland positions. Slope gradients are generally less than 10 percent. Vegetation consists of wet through dry meadow types consisting of grasses, sedges, and forbs. Elevation ranges from 5,000 to 6,000 feet. Soils have surfaces of volcanic ash or ones highly influenced by it. Drainage varies from poorly to well drained. Depth to bedrock normally ranges from 20 to 60 inches.

MAPPING UNIT N1

Mapping unit N1 consists of 70 percent or more of landtype N1 and may have inclusions of landtypes N2, N4, and N5. Landtype N1 is similar to N3 with the exception of slope gradient.

Landtype N1 has shallow to deep soils derived from recent volcanic ash overlying colluvium. Surface layers are thin with silt loam textures. Subsoil layers are thin to moderately thick with gravelly or cobbly textures of loams and clay loams.

Bedrock is composed of hard basalt and andesite with some soft to moderately hard tuffaceous interflow material. The basalt and andesite are moderately to highly fractured and competent. The tuffaceous interflow material is massive. Depth to bedrock ranges from 18 to 48 inches.

Typically, landtype N1 occurs on steep to very steep sideslopes with gradients of 30 to 70 percent with variable aspect.

This landtype ranges in elevation from 3,600 to 6,500 feet. It supports ponderosa pine, Douglas-fir, and white fir with a ground cover of elk sedge and pinegrass.

The soil is well drained. Permeability is rapid in the surface soil and moderate to slow in the subsoil.

Range of Profile Characteristics of Landtype N1

Litter: Needles, leaves, and decomposing organic matter, 0 to 2 inches thick, covering 60 to 70 percent of the soil surface.

Surface Rock Fragments: 0 to 20 percent of the soil surface is flat and angular rock fragments.

Surface Layers: Very dark grayish brown to brown silt loam; massive structure; 0 to 10 percent gravel and cobble by volume; nonsticky and nonplastic when wet; pH ranges from 5.6 to 6.5; 6 to 12 inches thick.

Subsoil Layers: Dark brown to brown with some reddish brown gravelly or cobbly loam and clay loam; moderate to strong, fine, angular and subangular blocky structure; 30 to 50 percent platy and angular gravel and cobble by volume; sticky to very sticky and plastic to very plastic when wet; pH ranges from 5.6 to 6.5; 12 to 36 inches thick.

MAPPING UNIT N2

Mapping unit N2 consists of 70 percent or more of landtype N2 and may have inclusions of landtypes N1 and N4. Landtype N2 is similar to landtype N1 with exceptions of volcanic ash depth and vegetation.

Landtype N2 has thin to deep soils derived from recent volcanic ash overlying colluvium. Surface layers are thin with silt loam textures. Subsoil layers are thin to moderately thick with gravelly or cobbly textures of loams and clay loams.

Bedrock is composed of hard basalt and andesite with some soft to moderately hard tuffaceous interflow material. The basalt and andesite are moderately to highly fractured and competent. The tuffaceous interflow material is massive. Depth to bedrock ranges from 18 to 48 inches.

Typically, landtype N2 occurs on steep to very steep, northerly-facing sideslopes with a gradient of 30 to 70 percent.

This landtype ranges in elevation from 4,000 to 6,500 feet. It supports white fir, Douglas-fir, larch, and lodgepole pine with a ground cover of huckleberry, pinegrass, and Columbia brome.

The soil is well drained. Permeability is rapid in the surface soil and moderate to slow in the subsoil.

Range of Profile Characteristics of Landtype N2

Litter: Needles, leaves, and decomposing organic matter, 0 to 2 inches thick, covering 70 to 90 percent of the soil surface.

Surface Rock Fragments: 0 to 10 percent of the soil surface is flat and angular rock fragments.

Surface Layers: Dark brown to brown silt loam; massive structure; nonsticky and nonplastic when wet; less than 15 percent gravel and cobble; pH ranges from 5.6 to 6.5; 12 to 18 inches thick.

Subsoil Layers: Dark brown to brown with some reddish brown gravelly or cobbly loam and clay loam; moderate to strong, fine, subangular to angular blocky structure; 30 to 50 percent platy and angular gravel and cobble by volume; sticky to very sticky and plastic to very plastic when wet; pH ranges from 5.6 to 6.5; 6 to 36 inches thick.

MAPPING UNIT N3

Mapping unit N3 consists of 70 percent or more of landtype N3 and may have inclusions of landtypes N1, N6, N7, and U4. Landtype N3 is similar to landtype N1 except for slope gradient.

Landtype N3 has shallow to moderately deep soils derived from recent volcanic ash overlying residuum. Surface layers are thin with silt loam textures. Subsoil layers are thin to moderately thick with gravelly or cobbly clay loam textures.

Bedrock is composed of hard basalt and andesite with some soft to moderately hard tuffaceous interflow material. The basalt and andesite are moderately to highly fractured and competent. The tuffaceous interflow material is massive. Depth to bedrock ranges from 12 to 36 inches.

Typically, landtype N3 occurs on all aspects of upland flats and sideslopes with gradients less than 30 percent.

This landtype ranges in elevation from 3,600 to 6,500 feet. It supports ponderosa pine, Douglas-fir, and white fir, with a ground cover of elk sedge and pinegrass.

The soil is well to moderately well drained. Permeability is rapid in the surface soil and moderate to slow in the subsoil.

Range of Profile Characteristics of Landtype N3

Litter: Needles, leaves, twigs, and decomposing organic matter, 0 to 2 inches thick, covering 60 to 80 percent of the soil surface.

Surface Rock Fragments: 0 to 20 percent of the soil surface is flat and angular rock fragments.

Surface Layers: Very dark grayish brown to brown silt loam; massive structure; 0 to 10 percent gravel and cobble by volume; nonsticky and nonplastic when wet; pH ranges from 5.6 to 6.5; 6 to 12 inches thick.

Subsoil Layers: Dark brown to brown with some reddish brown gravelly or cobbly clay loam; moderate to strong, fine and very fine, angular and subangular blocky structure; 30 to 50 percent platy and angular gravel and cobble by volume; sticky to very sticky and plastic to very plastic when wet; pH ranges from 5.6 to 6.5; 6 to 24 inches thick.

MAPPING UNIT N4

Mapping unit N4 consists of 70 percent or more of landtype N4 and may have inclusions of landtypes N1, N5, and N9. Landtype N4 is similar to landtype N9 with the exceptions of soil depth and vegetation.

Landtype N4 has very shallow to shallow soils derived from residuum. Soil layers are gravelly and cobbly loam textures.

Bedrock is composed of hard basalt and andesite with some soft to moderately hard tuffaceous interflow material. The basalt and andesite are moderately to highly fractured and competent. The tuffaceous interflow material is massive. Depth to bedrock ranges from 8 to 15 inches.

Typically, landtype N4 occurs on southerly aspects of steep to very steep sideslopes with gradients of 30 to 70 percent.

This landtype ranges in elevation from 3,600 to 6,500 feet. It supports juniper, mahogany, and big sagebrush with a ground cover of wheatgrass, fescue, and Sandberg bluegrass.

The soil is excessively drained with moderate permeability.

Range of Profile Characteristics of Landtype N4

Litter: Leaves and decomposing organic matter, 0 to 1 inch thick, covering less than 20 percent of the soil surface.

Surface Rock Fragments: 40 to 60 percent of the soil surface is flat and angular rock fragments.

Surface Layers: Very dark grayish brown to dark brown gravelly and cobbly loam; weak to moderate, fine to very fine, crumb and granular structure; 30 to 60 percent platy and angular gravel and cobble by volume; slightly sticky to sticky and plastic when wet; pH ranges from 5.6 to 6.5; 8 to 15 inches thick.

MAPPING UNIT N5

Mapping unit N5 consists of 70 percent or more of landtype N5 and may have inclusions of landtypes N4, N6, and N9. Landtype N5 is similar to landtype N6 with the exception of slope gradient.

Landtype N5 has shallow to moderately deep soils derived from residuum and colluvium. Surface layers are thin with gravelly loam textures. Subsoil layers are thin with gravelly or cobbly clay loam textures.

Bedrock is composed of hard basalt and andesite with some soft to moderately hard tuffaceous interflow material. The basalt and andesite are moderately to highly fractured and competent. The tuffaceous interflow material is massive. Depth to bedrock ranges from 12 to 30 inches.

Typically, landtype N5 occurs on southerly aspects of steep to very steep sideslopes with gradients of 30 to 70 percent.

The landtype ranges in elevation from 3,600 to 6,000 feet. It supports ponderosa pine with a ground cover of elk sedge, wheatgrass, fescue, and Sandberg bluegrass.

The soil is well drained. Permeability is moderate in the surface soil and moderate to slow in the subsoil.

Range of Profile Characteristics of Landtype N5

Litter: Needles, leaves, and decomposing organic matter, 0 to 1 inch thick, covering 30 to 50 percent of the soil surface.

Surface Rock Fragments: 10 to 30 percent of the soil surface is flat and angular rock fragments.

Surface Layers: Very dark grayish brown to dark brown gravelly loam; weak, fine to very fine, crumb and granular structure; 20 to 45 percent platy and angular gravel and cobble by volume; slightly sticky to sticky and slightly plastic to plastic when wet; pH ranges from 5.6 to 6.5; 6 to 10 inches thick.

Subsoil Layers: Dark brown to brown with some reddish brown gravelly or cobbly clay loam; moderate to strong, fine and very fine, angular and subangular blocky structure; 35 to 60 percent platy and angular gravel and cobble by volume; sticky to very sticky and plastic to very plastic when wet; pH ranges from 5.6 to 6.5; 6 to 18 inches thick.

MAPPING UNIT N6

Mapping unit N6 consists of 70 percent or more of landtype N6 and may have inclusions of landtypes N3, N5, and N7. Landtype N6 is similar to landtype N5 with exception of slope gradient.

Landtype N6 has thin to moderately thick soils derived from residuum. Surface layers are thin with gravelly loam textures. Subsoil layers are thin with gravelly or cobbly clay loam textures.

Bedrock is composed of hard basalt and andesite with some soft to moderately hard tuffaceous interflow material. The basalt and andesite are moderately to highly fractured and competent. The tuffaceous interflow material is massive. Depth to bedrock ranges from 12 to 30 inches.

Typically, landtype N6 occurs on upland flats and sideslopes with a southerly aspect and gradients less than 30 percent.

This landtype ranges in elevation from 3,600 to 6,000 feet. It supports ponderosa pine with a ground cover of elk sedge, wheatgrass, fescue, and Sandberg bluegrass.

The soil is well to moderately well drained. Permeability is moderate in the surface soil and moderate to slow in the subsoil.

Range of Profile Characteristics of Landtype N6

Litter: Needles, leaves, twigs, and decomposing organic matter, 0 to 1 inch thick, covering 40 to 60 percent of the soil surface.

Surface Rock Fragments: 10 to 30 percent of the soil surface is flat and angular rock fragments.

Surface Layers: Very dark grayish brown to dark brown gravelly loam; weak, fine to very fine crumb and granular structure; 20 to 45 percent platy and angular gravel and cobble by volume; slightly sticky to sticky, and slightly plastic to plastic when wet; pH ranges from 5.6 to 6.5; 6 to 10 inches thick.

Subsoil Layers: Dark brown to brown with some reddish brown gravelly or cobbly clay loam; moderate to strong, fine and very fine, angular and subangular blocky structure; 35 to 60 percent platy and angular gravel and cobble by volume; sticky to very sticky and plastic to very plastic when wet; pH ranges from 5.6 to 6.5; 6 to 18 inches thick.

MAPPING UNIT N7

Mapping unit N7 consists of 70 percent or more of landtype N7 and may have inclusions of landtypes N3, N6, and N8. Landtype N7 is similar to landtype N6 with exceptions of vegetation and soil depth.

Landtype N7 has very shallow to shallow soils derived from residuum. Soil layers are gravelly and cobbly loam textures.

Bedrock is composed of hard basalt and andesite with some soft to moderately hard tuffaceous interflow material. The basalt and andesite are moderately to highly fractured and competent. The tuffaceous interflow material is massive. Depth to bedrock ranges in elevation from 8 to 15 inches.

Typically, landtype N7 occurs on southerly aspects of upland flats and sideslopes with gradients less than 30 percent.

This landtype ranges in elevation from 3,600 to 6,000 feet. It supports juniper, mahogany, scattered ponderosa pine, and big sagebrush with a ground cover of Sandberg bluegrass and wheatgrass.

The soil is excessively drained with moderate permeability.

Range of Profile Characteristics of Landtype N7

Litter: Leaves and decomposing organic matter, 0 to 1 inch thick, covering less than 20 percent of he soil surface.

Surface Rock Fragments: 30 to 60 percent of the soil surface is flat and angular rock fragments.

Surface Layers: Very dark grayish brown to dark brown gravelly and cobbly loam; weak to moderate, fine and very fine, crumb and granular structure; 30 to 60 percent platy and angular gravel and cobble by volume; slightly sticky to sticky and plastic when wet; pH ranges from 5.6 to 6.5; 8 to 15 inches thick.

MAPPING UNIT N8

Mapping unit N8 consists of 70 percent or more of landtype N8 and may have inclusions of landtypes N7 and N9. Landtype N8 is similar to landtype N9 with the exception of slope gradient.

Landtype N8 has very shallow to shallow soils derived from residuum. Soil layers are gravelly to very gravelly and cobbly loam textures.

Bedrock is composed of hard basalt and andesite with some soft to moderately hard tuffaceous interflow material. The basalt and andesite are moderately to highly fractured and competent. The tuffaceous interflow material is massive. Depth to bedrock ranges from 4 to 12 inches.

Typically, landtype N8 occurs on southerly aspects of upland flats and sideslopes with gradients less than 30 percent.

This landtype ranges in elevation from 3,600 to 6,000 feet. It supports stiff and low sagebrush with a ground cover of wheatgrass and Sandberg bluegrass.

The soil is excessively drained with moderate permeability.

Range of Profile Characteristics of Landtype N8

Litter: Leaves and decomposing organic matter, 0 to ½ inch thick, covering less than 10 percent of the soil surface.

Surface Rock Fragments: 40 to 90 percent of the soil surface is flat and angular rock fragments.

Surface Layers: Very dark grayish brown to dark brown, gravelly to very gravelly and cobbly loam; weak, fine to very fine, crumb and granular structure; 30 to 70 percent platy and angular gravel and cobble by volume; slightly sticky to sticky and plastic when wet; pH ranges from 5.6 to 6.5; 4 to 12 inches thick.

MAPPING UNIT N9

Mapping unit N9 consists of 70 percent or more of landtype N9 and may have inclusions of landtypes N1, N4, and N5. Landtype N9 is similar to landtype N4 with exceptions of vegetation and soil depth.

Landtype N9 has very shallow to shallow soils derived from colluvium. Soil layers are gravelly and cobbly loam textures.

Bedrock is composed of hard basalt and andesite with some soft to moderately hard tuffaceous interflow material. The basalt and andesite are moderately to highly fractured and competent. The tuffaceous interflow material is massive. Depth to bedrock ranges from 4 to 12 inches.

Typically, landtype N9 occurs on southerly aspects of steep to very steep sideslopes with gradients of 30 to 70 percent.

This landtype ranges in elevation from 3,600 to 5,600 feet. It supports big and low sagebrush, wheatgrass, fescue, and Sandberg bluegrass.

The soil is excessively drained with moderate permeability.

Range of Profile Characteristics of Landtype N9

Litter: Leaves and decomposing organic matter, 0 to ½ inch thick, covering less than 10 percent of the soil surface.

Surface Rock Fragments: 40 to 70 percent of the soil surface is flat and angular rock fragments.

Surface Layers: Very dark grayish brown to dark brown gravelly and cobbly loam; weak, fine and very fine, crumb and granular structure; 30 to 70 percent platy and angular gravel and cobble by volume; slightly sticky to sticky and plastic when wet; pH ranges from 5.6 to 6.5; 4 to 12 inches thick.

MAPPING UNIT P1

Mapping unit P1 consists dominantly of landtype P1 and minor amounts of landtypes P2, P9, Y7, and M1. Landtype P1 is similar to landtype L5 with the exceptions of landform and geology.

Landtype P1 has moderately deep to deep soils with ash surfaces and plastic subsoils derived from residuum and old buried loess. Surface soils are moderately thick to thick ash with loam, sandy loam, and silt loam textures. Subsoils are gravelly, cobbly clay loams, silty clay loams, and clays.

Bedrock is competent, hard, highly fractured to massive basalts of the Picture Gorge formation of the Columbia River group. Depth to bedrock ranges from 20 to 60 inches.

Typically, landtype P1 occurs on gently sloping straight to slightly concave basalt flow surfaces in depressional positions adjacent to drainage bottoms. Slopes are commonly less than 20 percent in gradient with any aspect.

This landtype ranges in elevation from 4,500 to 6,000 feet and supports the community types of lodgepole - pinegrass - grouse huckleberry and lodgepole - grouse huckleberry.

The soil is well drained. Permeability is rapid in the surface soils and moderate to slow in the subsoils.

Range of Profile Characteristics of Soil P1

Litter: Needles, leaves, twigs, and decomposing organic matter, 1 to 3 inches thick.

Surface Layers: Dark brown to dark yellowish brown, sandy loams, loams, and silt loams; single grained to weak, very fine and fine, subangular structure; trace to 5 percent very fine pumice gravels by volume; nonsticky to slightly sticky, nonplastic; pH ranges 6.0 to 6.5; 18 to 39 inches thick.

Subsoil Layers: Dark grayish brown, dark brown, and dark yellowish brown, gravelly clay loams, silty clay loams, and clays; massive to moderate, very fine and fine, subangular blocky structure; 35 to 50 percent subangular gravels and cobbles by volume; sticky, plastic to very plastic; pH ranges 6.7 to 7.0; 3 to 13 inches thick.

MAPPING UNIT P2

Mapping unit P2 consists dominantly of landtype P2 and minor amounts of landtypes P3, P9, Y2, and P1. Landtype P2 is similar to landtype P3 with the exception of vegetation and aspect. Similar to P9 with the exceptions of vegetation and landform. Similar to Y2 with the exceptions of landform and vegetation.

Landtype P2 has moderately deep to deep soils derived from ash over loess and residuum. Surface soils are thin to thick recent ash deposits with sandy loam, loam, and silt loam textures. Subsoils are very thin to thin; nongravelly to gravelly; clay loams to silty clay loams. Occasionally a very thin gravelly clay layer is lying immediately above bedrock.

Bedrock is competent, hard, highly fractured basalts of the Picture Gorge formation of the Columbia River group. Depth to bedrock ranges from 20 to 60 inches.

Typically, landtype P2 occurs on northerly aspects of gentle to moderately steep draw and scarp slopes plateau topography. The slopes are slightly concaved with gradients of 2 to 40 percent.

This landtype ranges in elevation from 4,500 to 6,000 feet and supports the community type of mixed conifer - pinegrass - ash soils.

The soil is well drained. Permeability is rapid in the surface soils and slow in the subsoils.

Range of Profile Characteristics of Soil P2

Litter: Needles, leaves, twigs, and decomposing organic matter; ½ to 3 inches thick.

Surface Layers: Dark brown, dark reddish brown to dark yellowish brown; fine sandy loams, loams, and silt loams, massive to moderate, very fine, subangular blocky structure; 5 to 20 percent, fine pumice to angular gravels and cobbles by volume; nonsticky to slightly sticky, nonplastic to slightly plastic; pH range of 6.3 to 7.0; 20 to 55 inches thick.

Subsoil Layers: Dark reddish brown, dark brown to strong brown; clay loams, silty clay loams and clays; massive to moderate, very fine, subangular blocky structure; 10 to 50 percent angular gravel and cobble by volume; slightly sticky to sticky, plastic; pH ranges 6.2 to 7; 2 to 19 inches thick.

MAPPING UNIT P3

Mapping unit P3 consists dominantly of landtype P3 and minor amounts of landtypes P2, P8, and P4. Landtype P3 is similar to landtype P8 with the exceptions of slope gradient and topographic positions.

Landtype P3 has shallow to moderately deep soils derived from ash, loess, and residuum. Surface soils are thin to moderately thick, sandy loams, loams, and silt loams. Subsoils are either lacking or very thin to thin, nongravelly to very gravelly, clay loams to silty clay loams. Occasionally, a very thin gravelly clay layer lies immediately above bedrock.

Bedrock is competent, hard, highly fractured basalts of the Picture Gorge formation of the Columbia River group. Depth to bedrock ranges from 18 to 40 inches.

Typically, landtype P3 occurs on all aspects of gently sloping plateau flats, often taking the appearance of timbered stringers within the scabland pattern of vegetation. Slope gradients are normally less than 15 percent.

This landtype ranges in elevation from 4,300 to 5,500 feet and supports the community types of ponderosa pine - fescue and ponderosa pine - Douglas-fir - elk sedge.

The soil is well drained. Permeability is rapid to moderate in the surface soils and slow in the subsoils.

Range of Profile Characteristics of Soil P3

Litter: Needles, leaves, twigs, and decomposing organic matter; 1 to 3 inches thick.

Surface Layers: Very dark brown, dark reddish brown to dark grayish brown; sandy loams, loams, and silt loams; weak, very fine to fine crumb to weak, very fine, subangular blocky structure; 5 to 20 percent angular gravels and cobbles by volume; slightly sticky, slightly plastic; pH range of 6.0 to 7.5; 6 to 28 inches thick.

Subsoil Layers: Dark brown, brown to dark reddish brown, clay loams, silty clay loams to clays; massive to strong, very fine, subangular blocky structure; 0 to 70 percent angular gravels and cobbles by volume; slightly sticky to sticky, plastic; pH range of 7.0 to 7.5; 0 to 15 inches thick.

MAPPING UNIT P4

Mapping unit P4 consists dominantly of landtype P4 and minor amounts of landtypes P5, P3, P2, and X9. Landtype P4 is similar to landtype P5 with the exceptions of soil depth and vegetation.

Landtype P4 has shallow soils derived from loess and very thin residuum. Surface soils are thin loams and silt loams. Subsoils are lacking or are very thin, nongravelly to very gravelly clay loams, silty clays, and clays.

Bedrock is competent, hard, highly fractured basalts of the Picture Gorge formation of the Columbia River group. Depth to bedrock ranges from 12 to 18 inches.

Typically, landtype P4 occurs on all aspects of gentle sloping basalt flow surfaces. Slope gradients are generally less than 15 percent but range to 35 percent.

This landtype ranges in elevation from 4,300 to 5,500 feet and supports the community types of low sagebrush - bunchgrass, juniper - low sagebrush, and ponderosa pine - wheatgrass. Site quality is nonforest to noncommercial pine.

The soil is well drained. Permeability is moderate in the surface soils and slow to very slow in the subsoils.

Range of Profile Characteristics of Soil P4

Litter: Litter is sparse, mostly under plants. Up to 30 percent of ground surface is gravel, cobble, and stone.

Surface Layers: Very dark brown, dark brown, to dark reddish brown; loams and silt loams; weak to moderate, very fine, subangular blocky structure; 5 to 20 percent angular gravels, cobbles, stone by volume; slightly sticky, slightly plastic; pH range of 6.5 to 7.3; 6 to 18 inches thick.

Subsoil Layers: Very dark brown to dark brown; clay loams to clays; massive to strong, very fine, subangular blocky structure; 5 to 60 percent angular gravels, cobbles, and stone by volume; sticky to very sticky, plastic to very plastic; pH range of 7.0 to 7.3; 0 to 7 inches thick.

MAPPING UNIT P5

Mapping unit P5 consists dominantly of landtype P5 and minor amounts of landtypes S1, P4, X8, and X9. Landtype P5 is similar to landtype P4 with the exceptions of soil depth and vegetation. Similar to S1 with exception of soil depth. S1 is the rocky scabland and makes up to 30 percent of the P5 mapping unit.

Landtype P5 has very shallow soils derived from loess and very thin residual materials. Surfaces are very thin to thin, nongravelly to gravelly, loams and silt loams. Subsoils are lacking or are very thin, nongravelly to gravelly, clay loams to clays.

Bedrock is competent, hard, highly fractured basalts of the Picture Gorge formation of the Columbia River group. Depth to bedrock ranges from 5 to 15 inches.

Typically, landtype P5 occurs on all aspects of gentle sloping basalt flow surfaces. Slope gradients are generally less than 15 percent but range to 35 percent.

This landtype ranges in elevation from 4,300 to 7,000 feet and supports community types of bluegrass scablands, stiff sage scablands, and juniper stiff sage scablands.

The soil is well drained. Permeability is moderate in the surface soils and slow to very slow in the subsoils.

Range of Profile Characteristics of Soil P5

Litter: Litter found only under plants. 30 to 60 percent gravels, cobbles, and stone cover on ground surface.

Surface Layers: Very dark brown, dark brown, to dark reddish brown; loams and silt loams; weak to moderate, very fine, subangular blocky structures; 5 to 60 percent angular gravels and cobbles by volume. Slightly sticky, slightly plastic; pH range of 6.5 to 7.2; 4 to 8 inches thick.

Subsoil Layers: Very dark brown to dark brown; clay loams to clays; massive to strong, very fine, subangular blocky structure; 5 to 60 percent angular; plastic; pH range of 7.0 to 7.2; 0 to 7 inches thick.

MAPPING UNIT P8

Mapping unit P8 consists dominantly of landtype P8 and minor amounts of landtypes P3, Y4, P4, and P5. Landtype P8 is similar to landtype P3 with the exception of landform.

Landtype P8 has shallow to moderately deep soils. Surface soils are very thin to thin, sandy loams, loams, and silt loams derived from mixtures of ash and loess. Subsoils are either lacking or are very thin to thin, nongravelly to very gravelly, silty clay loams, and clay loams. Occasionally, a very thin gravelly clay layer lies immediately above bedrock.

Bedrock is competent, hard, highly fractured basalts of the Picture Gorge formation of the Columbia River group. Depth to bedrock ranges from 18 to 40 inches.

Typically, landtype P8 occurs on all aspects of gentle to moderately steep, straight to concaved shaped slopes of drainages and basalt flow scarps. Slope gradients are 15 to 30 percent.

This landtype ranges in elevation from 4,300 to 5,500 feet and supports the community types of ponderosa pine - fescue and ponderosa pine - Douglas-fir - elk sedge.

The soil is well drained. Permeability is moderate in the surface soils and moderate to slow in the subsoils.

Range of Profile Characteristics of Soil P8

Litter: Needles, leaves, twigs, and decomposing organic matter; ½ to 3 inches thick.

Surface Layers: Very dark brown to dark reddish brown; sandy loams, loams, and silt loams; weak, very fine, subangular blocky structure; 5 to 20 percent fine, angular gravels; nonsticky to slightly sticky, nonplastic to plastic; pH range of 6.3 to 7; 6 to 28 inches thick.

Subsoil Layers: Dark reddish to yellowish brown, gravelly to very gravelly, silty clay loams, clays, and clay loams; 10 to 60 percent angular gravels and cobbles by volume; slightly sticky to sticky, slightly plastic to plastic; pH range of 6.8 to 7.3; 0 to 15 inches thick.

MAPPING UNIT P9

Mapping unit P9 consists dominantly of landtype P9 and minor amounts of landtypes P5, P1, Y1, Y8, Y7, and M1. Landtype P9 is similar to landtype P2 with the exceptions of vegetation cover and elevation. Similar to Y7 with the exceptions of vegetation and soils.

Landtype P9 has shallow to moderately deep soils derived from ash over loess. Surface soils are thin to moderately thick, recent ash with sandy loams, loams, and silt loam textures. Subsoils are thin to moderately thick, nongravelly to gravelly textures of loams and silt loams.

Bedrock is competent, hard, highly fractured basalts of the Picture Gorge formation of the Columbia River group. Depth to bedrock ranges from 18 to 40 inches.

Typically, landtype P9 occurs on all aspects of upper elevation plateau flats and slight depression areas. Slope gradients are 2 to 15 percent.

This landtype ranges in elevation from 5,500 to 7,000 feet and supports the community types of white fir - twinflower - forb and mixed conifer - pinegrass, ash soils in fir dominated stages. Site class 5 - 6 for Douglas-fir.

The soil is well drained. Permeability is rapid in the surface soils and moderate in the subsoils.

Range of Profile Characteristics of Soil P9

Litter: Needles, leaves, twigs, and decomposing organic matter; 1 to 3 inches thick.

Surface Layers: Dark brown to brown; sandy loams, loams, and silt loams; structureless to weak, very fine, subangular blocky structure; 5 to 20 percent angular gravels and cobbles by volume; nonsticky to slightly sticky, nonplastic to slightly plastic; pH range of 6.7 to 7.0; 16 to 21 inches thick.

Subsoil Layers: Dark brown to dark yellowish brown; loams and silt loams; massive to moderate, very fine, subangular blocky structure; 20 to 40 percent angular gravels and cobbles by volume; nonsticky to slightly sticky, nonplastic to slightly plastic; pH range of 7.0 to 7.5; 9 to 34 inches thick.

MAPPING UNIT Q1

Mapping unit Q1 consists of 70 percent or more of landtype Q1 and may have inclusions of landtypes Q2 and Q3. Landtype Q1 is similar to landtype Q3 with the exceptions of soil depth and vegetation.

Landtype Q1 has shallow to moderately deep soils derived from residuum. Surface layers are thin with loam to gravelly loam textures. Subsoil layers are thin with gravelly and cobbly clay loam textures.

Bedrock is composed of moderately hard to hard rhyolite. It is massive to moderately fractured and competent. Depth to bedrock ranges from 12 to 24 inches.

Typically, landtype Q1 occurs on southerly aspects of upland flats with slope gradients less than 30 percent.

This landtype ranges in elevation from 4,500 to 6,000 feet. It supports ponderosa pine and bitterbrush with a ground cover of ross sedge, elk sedge, fescue, and wheatgrass.

The soil is well drained. Permeability is moderate in the surface soil and moderate in the subsoil.

Range of Profile Characteristics of Landtype Q1

Litter: Needles, leaves, and decomposing organic matter, 0 to 1 inch thick, covering 30 to 50 percent of the soil surface.

Surface Rock Fragments: 30 to 50 percent of the soil surface is platy and angular rock fragments.

Surface Layers: Dark brown loam to gravelly loam; weak, fine to very fine, crumb structure; 20 to 40 percent platy gravel and cobble by volume; slightly sticky and slightly plastic when wet; pH ranges from 5.8 to 6.5; 6 to 10 inches thick.

Subsoil Layers: Brown to dark brown gravelly and cobbly clay loam; moderate fine to very subangular blocky structure; 30 to 50 percent platy gravel and cobble when wet; sticky and plastic; pH ranges from 5.8 to 6.5; 6 to 18 inches thick.

MAPPING UNIT Q2

Mapping unit Q2 consists of 70 percent or more of landtype Q2 and may have inclusions of landtypes Q1 and Q3. Landtype Q2 is similar to landtype Q9 with the exceptions of soil and vegetation.

Landtype Q2 has shallow to moderately deep soils derived from residuum and colluvium. Surface layers are thin with loam to gravelly loam textures. Subsoil layers are thin to moderately thick with gravelly loam textures.

Bedrock is composed of a mixture of soft to moderately hard tuffaceous sediments, rhyolitic ejecta, and hard to moderately hard rhyolite. The tuffaceous sediments and rhyolitic ejecta are massive and slightly fractured and incompetent to moderately competent. The rhyolite is massive and moderately fractured and competent. Depth to bedrock ranges from 18 to 36 inches.

Typically, landtype Q2 occurs on southerly-facing upland flats and sideslopes with gradients less than 50 percent.

This landtype ranges in elevation from 4,500 to 6,000 feet. It supports ponderosa pine with a ground cover of fescue, elk sedge, wheatgrass, and sandberg bluegrass.

The soil is well drained. Permeability is moderate in the surface soil and moderate in the subsoil.

Range of Profile Characteristics of Landtype Q2

Litter: Needles, leaves, and decomposing organic matter, 0 to 1 inch thick, covering 40 to 60 percent of the soil surface.

Surface Rock Fragments: 20 to 40 percent of the soil surface is platy and angular rock fragments.

Surface Layers: Very dark gray to dark brown loam and gravelly loam; weak, fine, crumb structure; 20 to 40 percent platy and angular gravel and cobble by volume; nonsticky and nonplastic when wet; pH ranges from 5.6 to 6.5; 8 to 12 inches thick.

Subsoil Layers: Dark brown to brown gravelly loam; weak, fine, subangular blocky structure; 30 to 50 percent platy and angular gravel and cobble by volume; nonsticky to slightly sticky and nonplastic to slightly plastic when wet; pH ranges from 6.0 to 7.0; 10 to 24 inches thick.

MAPPING UNIT Q3

Mapping unit Q3 consists of 70 percent or more of landtype Q3 and may have inclusions of landtypes Q1, Q2, and Q4. Landtype Q3 is similar to landtype Q4 with the exception of slope gradient.

Landtype Q3 has shallow soils derived from residuum. Soil textures are gravelly and cobbly loams.

Bedrock is composed of moderately hard to hard rhyolite. It is massive to moderately fractured and competent. Depth to bedrock ranges from 10 to 15 inches.

Typically, landtype Q3 occurs on southerly aspects of upland flats with slope gradients less than 30 percent.

This landtype ranges in elevation from 4,500 to 6,000 feet. It supports juniper, mahogany, big sagebrush, scattered ponderosa pine, and a ground cover of wheatgrass, fescue, and Sandberg bluegrass.

The soil is excessively drained with moderate permeability.

Range of Profile Characteristics of Landtype Q3

Litter: Leaves and decomposing organic matter, 0 to 1 inch thick, covering less than 10 percent of the soil surface.

Surface Rock Fragments: 40 to 60 percent of the soil surface is platy and angular rock fragments.

Surface Layers: Dark brown gravelly and cobbly loam; fine to very fine, crumb and subangular blocky structure; 30 to 50 percent platy gravel and cobble by volume; slightly sticky and slightly plastic when wet; pH ranges from 5.8 to 6.5; 10 to 15 inches thick.

MAPPING UNIT Q4

Mapping unit Q4 consists of 70 percent or more of landtype Q4 and may have inclusions of landtypes Q1, Q2, and Q3. Landtype Q4 is similar to Q3 with the exception of slope gradient.

Landtype Q4 has very shallow to shallow soils derived from colluvium. Soil layers are gravelly and cobbly loam textures.

Bedrock is composed of moderately hard to hard rhyolite. It is massive to moderately fractured and competent. Depth to bedrock ranges from 6 to 15 inches.

Typically, landtype Q4 occurs on all aspects of steep to very steep, exposed sideslopes with gradients of 30 to 70 percent.

This landtype ranges in elevation from 4,500 to 6,000 feet. It supports juniper, mahogany, big sagebrush, scattered ponderosa pine, and a ground cover of wheatgrass, fescue, and Sandberg bluegrass.

The soil is excessively drained with moderate permeability.

Range of Profile Characteristics of Landtype Q4

Litter: Leaves and decomposing organic matter, 0 to 1 inch thick, covering less than 10 percent of the soil surface.

Surface Rock Fragments: 30 to 60 percent of the soil surface is platy and angular rock fragments.

Surface Layers: Dark brown gravelly and cobbly loam; fine to very fine, crumb and subangular blocky structure; 30 to 50 percent platy gravel and cobble by volume; slightly sticky and slightly plastic when wet; pH ranges from 5.7 to 6.5; 6 to 15 inches thick.

MAPPING UNIT Q7

Mapping unit Q7 consists of 70 percent or more of landtype Q7 and may have inclusions of landtypes Q3 and Q4. Landtype Q7 is similar to landtype Q8 with the exception of bedrock.

Landtype Q7 has very shallow soils derived from residuum. Soil textures are cobbly and gravelly loams.

Bedrock is composed of moderately hard to hard rhyolite. It is massive to moderately fractured and competent. Depth to bedrock ranges from 4 to 8 inches.

Typically, landtype Q7 occurs on all aspects of upland flats with slope gradients less than 30 percent.

This landtype ranges in elevation from 4,500 to 6,000 feet. It supports low and stiff sagebrush and Sandberg bluegrass.

The soil is excessively drained with moderate permeability.

Range of Profile Characteristics of Landtype Q7

Litter: Leaves and decomposing organic matter, 0 to ½ inch thick, covering less than 10 percent of the soil surface.

Surface Rock Fragments: 50 to 100 percent of the soil surface is platy and angular rock fragments.

Surface Layers: Brown to dark brown cobbly and gravelly loam; weak, fine and very fine, crumb and subangular blocky structure; 40 to 60 percent platy gravel and cobble by volume; slightly sticky and slightly plastic when wet; pH ranges from 5.8 to 6.5; 4 to 8 inches thick.

MAPPING UNIT Q8

Mapping unit Q8 consists of 70 percent or more of landtype Q8 and may have inclusions of landtype Q3. Landtype Q8 is similar to Q9 with the major exception of bedrock.

Landtype Q8 has shallow to moderately deep soils derived from recent volcanic ash overlying residuum. Surface layers are thin with silt loam textures. Subsoil layers are thin to moderately thick with gravelly and cobbly clay loam textures.

Bedrock is composed of moderately hard to hard rhyolite. It is massive to moderately fractured and competent. Depth to bedrock ranges from 15 to 30 inches.

Typically, landtype Q8 occurs on all aspects of upland flats with slope gradients less than 30 percent.

This landtype ranges in elevation from 4,500 to 6,000 feet. It supports ponderosa pine, Douglas-fir, and white fir, with a ground cover of elk sedge and pinegrass.

The soil is well drained. Permeability is rapid in the surface soil and moderate in the subsoil.

Range of Profile Characteristics of Landtype Q8

Litter: Needles, leaves, and decomposing organic matter, 1 to 2 inches thick, covering 40 to 60 percent of the soil surface.

Surface Rock Fragments: 0 to 20 percent of the soil surface is platy and angular rock fragments.

Surface Layers: Very dark grayish brown to brown silt loam; massive structure; nonsticky and nonplastic when wet; 0 to 20 percent platy gravel and cobble by volume; pH ranges from 5.8 to 6.5; 6 to 10 inches thick.

Subsoil Layers: Brown to dark brown gravelly and cobbly clay loam; moderately fine to very fine subangular to angular blocky structure; 30 to 50 percent platy gravel and cobble by volume; sticky and plastic when wet; pH ranges from 5.8 to 6.5; 9 to 24 inches thick.

MAPPING UNIT Q9

Mapping unit Q9 consists of 70 percent or more of landtype Q9 and may have inclusions of landtypes Q2 and Q8. Landtype Q9 is similar to Q8 with the major exception of bedrock.

Landtype Q9 has moderately deep to deep soils derived from recent volcanic ash overlying residuum and colluvium. Surface layers are thin with silt loam textures. Subsoil layers are thin to moderately thick with gravelly loam textures.

Bedrock is composed of a mixture of soft to moderately hard tuffaceous sediments, rhyolitic ejecta, and hard to moderately hard rhyolite. The tuffaceous sediments and rhyolitic ejecta are massive to slightly fractured and incompetent to moderately competent. The rhyolite is massive to moderately fractured and competent. Depth to bedrock ranges from 24 to 48 inches.

Typically, landtype Q9 occurs on all aspects of upland flats and sideslopes with gradients less than 50 percent and variable aspect.

This landtype ranges in elevation from 4,500 to 6,500 feet. It supports ponderosa pine, Douglas-fir, and white fir, with ground cover of pinegrass and elk sedge.

The soil is well drained. Permeability is rapid in the surface soil and moderate in the subsoil.

Range of Profile Characteristics of Landtype Q9

Litter: Needles, leaves, and decomposing organic matter, 0 to 2 inches thick, covering 60 to 80 percent of the soil surface.

Surface Rock Fragments: 0 to 10 percent of the soil surface is platy and angular rock fragments.

Surface Layers: Very dark grayish brown to brown silt loam; massive structure; less than 10 percent gravel and cobble; nonsticky and nonplastic when wet; pH ranges from 5.6 to 6.5; 8 to 12 inches thick.

Subsoil Layers: Dark brown to brown gravelly loam; weak, fine, subangular blocky structure; 30 to 50 percent platy and angular gravel and cobble; nonsticky to slightly sticky and nonplastic to slightly plastic when wet; pH ranges from 6.0 to 7.0; 16 to 30 inches thick.

MAPPING UNIT R1

Mapping unit R1 consists dominantly of landtype R1 and minor amounts of landtypes R2, R4, and R5. Landtype R1 is similar to landtype R2 with the exception of slope gradient. R2 has slopes of less than 30 percent.

Landtype R1 has deep to very deep soils with ash surfaces and subsoils derived from ash overlying colluvium from rhyolite rock. Surface soils are thin ash with loamy sands, sandy loams, and loam textures. Subsoils are moderately thick to thick, gravelly to very gravelly loams.

Bedrock is hard, slightly to moderately fractured, pinkish rhyolite. It is competent. Depth to bedrock ranges from 40 to 80 inches.

Typically, landtype R1 occurs on steep to very steep mountain sideslopes of a southerly aspect. Slope gradients are commonly 30 to 50 percent but range to 70 percent.

This landtype ranges in elevation from 5,000 to 6,000 feet and supports the community types of mixed conifer - pinegrass, ash soils, predominant overstory consists of ponderosa pine and Douglas-fir.

The soil is well drained. Permeability is rapid in the surface soils and moderate in the subsoils.

Range of Profile Characteristics of Soil R1

Litter: Needles, leaves, twigs, and decomposing organic matter, 1 to 2 inches thick.

Surface Layers: Dark brown to strong brown, loamy sands, sandy loams, and loams; structureless to weak, fine crumb structure; trace to 10 percent fine pumice gravels by volume; nonsticky, nonplastic; pH ranges from 5.9 to 7.0; 6 to 18 inches thick.

Subsoil Layers: Brown gravelly to very gravelly loams; weak to moderate, fine, subangular blocky structure; 40 to 60 percent subangular to platy gravels and cobbles (some stone) by volume; nonsticky to slightly sticky, nonplastic; pH ranges from 5.8 to 6.5; 18 to 78 inches thick.

MAPPING UNIT R2

Mapping unit R2 consists dominantly of landtype R2 and minor amounts of landtypes R5, R1, and R4. Landtype R2 is similar to landtype R1 with the exception of slope gradient. R1 has slopes of greater than 30 percent with more colluvium or gravel content in subsoil.

Landtype R2 has deep to very deep soils with ash surfaces and subsoils derived from ash overlying residuum and colluvium from rhyolite rock. Surface soils are thin ash with loamy sands, sandy loam, and loam textures. Subsoils are moderately thick to thick, gravelly to very gravelly loams.

Bedrock is hard, slightly to moderately fractured. It is competent. Depth to bedrock ranges from 40 to 80 inches.

Typically, landtype R2 occurs on gentle to moderately steep ridgetops and sideslopes of a southerly aspect. Slope gradients range from 2 to 30 percent.

This landtype ranges in elevation from 5,000 to 6,000 feet and supports the community type of mixed conifer - pinegrass, ash soils. Predominant overstory consists of ponderosa pine and Douglas-fir.

The soil is well drained. Permeability is rapid in the surface soils and moderate in the subsoils.

Range of Profile Characteristics of Soil R2

Litter: Needles, leaves, twigs, and decomposing organic matter, 1 to 2 inches thick.

Surface Layers: Dark brown to strong brown, loamy sands, sandy loams, and loams; structureless to weak, fine crumb structure; trace to 10 percent fine pumice gravels by volume; nonsticky, nonplastic; pH ranges from 5.9 to 7.0; 6 to 18 inches thick.

Subsoil Layers: Brown gravelly to very gravelly loams; weak to moderate, fine subangular structure; 40 to 60 percent subangular to platy gravels and cobbles by volume; nonsticky to slightly sticky, nonplastic; pH ranges from 5.8 to 6.5; 18 to 78 inches thick.

MAPPING UNIT R3

Mapping unit R3 consists dominantly of landtype R3 and minor amounts of landtypes R6 and R5. Landtype R3 is similar to Landtype R6 with the exception of slope gradient. R3 has slopes over 30 percent while R6 doesn't. R3 has a tendency to have more gravel content on steeper slopes.

Landtype R3 has deep to very deep soils with ash surfaces and subsoils derived from ash overlying colluvium from rhyolite rock. Surface soils are thin to moderately thick, loamy sands, sandy loams, and loams. Subsoils are moderately thick to thick, gravelly to very gravelly loams.

Bedrock is hard, slightly to moderately fractured, pinkish rhyolite. It is competent. Depth to bedrock ranges from 40 to 80 inches.

Typically, landtype R3 occurs on northerly aspects of steep to very steep, upper portions of concaved shaped mountain sideslopes which flank rhyolite flows. Slope gradients are commonly 30 to 50 percent with some up to 70 percent.

This landtype ranges in elevation from 5,000 to 6,000 feet and supports the community types of white fir - twinflower - forb and mixed conifer - pinegrass, ash soils in fir dominated stages.

The soil is well drained. Permeability is rapid in the surface soils and moderate in the subsoils.

Range of Profile Characteristics of Soil R3

Litter: Needles, leaves, twigs, and decomposing organic matter, 1 to 2 inches thick.

Surface Layers: Dark brown to strong brown sandy loams, loamy sands, and loams; structureless to weak, subangular blocky structure; 5 to 20 percent pumice pebbles and larger gravels by volume; nonsticky and nonplastic; pH ranges from 6.0 to 6.6; 10 to 30 inches thick.

Subsoil Layers: Brown gravelly to very gravelly loams; weak, very fine to fine, subangular blocky structure; 40 to 70 percent angular to platy gravels and cobbles (some stones) by volume; slightly sticky, slightly plastic; pH ranges from 5.8 to 6.3; 18 to 72 inches thick.

MAPPING UNIT R4

Mapping unit R4 consists dominantly of landtype R4 and minor amounts of landtypes R5, R1, R2, and rockland. Landtype R4 is similar to landtype R5 with the exception of slope gradient. R4 slopes are greater than 30 percent while R5 slopes are less than 30 percent.

Landtype R4 has very shallow soils derived from colluvium and residuum of rhyolite. The soil textures are gravelly to very gravelly sandy loams.

Bedrock is hard, slightly to moderately fractured, pinkish rhyolite. It is competent. Depth to bedrock ranges from 6 to 14 inches.

Typically, landtype R4 occurs on steep to very steep convex to slightly concave mountain sideslopes of all aspects. Slope gradients are commonly 30 to 50 percent but range up to 70 percent.

This landtype ranges in elevation from 5,000 to 6,000 feet and supports the community types of ponderosa pine - wheatgrass, juniper - bunchgrass, and bunchgrass on shallow soil and steep slopes. Major overstory consists of juniper and scattered ponderosa pine.

The soil is well drained. Permeability is rapid in the surface soils.

Range of Profile Characteristics of Soil R4

Litter: Needles, leaves, twigs, and decomposing organic matter, 0 to ½ inches thick.

Surface Layers: Dark brown to strong brown, gravelly to very gravelly, sandy loams; weak, fine, granular structure; 40 to 60 percent subangular gravel and cobble by volume; nonsticky, nonplastic; pH ranges from 5.8 to 6.8; 6 to 14 inches thick.

Subsoil Layers: Subsoil characteristics are not differentiated from the surface layer characteristics for this landtype.

MAPPING UNIT R5

Mapping unit R5 consists dominantly of landtype R5 and minor amounts of landtypes R2, M8, R4, R1, and rocklands. Landtype R5 is similar to landtype R4 with the exception of slope gradient. R5 has slope gradients of less than 30 percent.

Landtype R5 has very shallow to shallow soils derived from colluvium and residuum of rhyolite. The soil textures are gravelly to very gravelly sandy loams.

Bedrock is hard, slightly to moderately fractured, pinkish rhyolite. It is competent. Depth to bedrock ranges from 6 to 14 inches.

Typically, landtype R5 occurs on all aspects of gentle to moderatley steep upland flats and sideslopes of rhyolite flows. Slope gradients are less than 30 percent.

This landtype ranges in elevation from 5,000 to 6,000 feet and supports the community types of ponderosa pine - wheatgrass, juniper - bunchgrass, and bunchgrass on shallow soil, steep slopes.

The soil is well drained. Permeability is rapid in the surface soils.

Range of Profile Characteristics of Soil R5

Litter: Needles, leaves, twigs, and decomposing organic matter; 0 to ½ inches thick.

Surface Layers: Dark brown to strong brown, gravelly to very gravelly, sandy loams; weak, fine, granular structure; 40 to 60 percent subangular gravel and cobble by volume; nonsticky, nonplastic; pH 5.8 to 6.8; 6 to 14 inches thick.

Subsoil Layers: Subsoil characteristics are not differentiated from the surface layer characteristics for this landtype.

MAPPING UNIT R6

Mapping unit R6 consists dominantly of landtype R6 and minor amounts of landtypes R3, R2, and M8. Landtype R6 is similar to landtype R3 with the exception of slope gradient. R6 has slopes under 30 percent while R3 has slopes over 30 percent.

Landtype R6 has deep to very deep soils with surfaces of ash and subsoils derived from colluvium and residuum from rhyolite rock. Surface soils are thin to moderately thick loamy sands, sandy loams, and loams. Subsoils are moderately thick to thick, gravelly to very gravelly loams.

Bedrock is hard, slightly to moderately fractured, pinkish rhyolite. It is competent. Depth to bedrock ranges from 40 to 100 inches.

Typically, landtype R6 occurs on northerly aspects of gentle to moderately steep, lower portions of concaved shaped mountain sideslopes which flank rhyolite flows. Slope gradients are less than 30 percent.

This landtype ranges in elevation from 5,000 to 6,000 feet and supports the community types of white fir - twinflower - forb and mixed conifer - pinegrass, ash soils in fir dominated stages.

The soil is well drained. Permeability is rapid in the surface soils and moderate in the subsoils.

Range of Profile Characteristics of Soil R6

Litter: Needles, leaves, twigs, and decomposing organic matter, 1 to 2 inches thick.

Surface Layers: Dark brown to strong brown sandy loams; loamy sands and loams; structureless to weak, subangular blocky structure; 5 to 20 percent pumice pebbles and larger gravels by volume; nonsticky to nonplastic; pH ranges from 6.0 to 6.6; 10 to 30 inches thick.

Subsoil Layers: Brown gravelly to very gravelly loams; weak, very fine to fine, subangular blocky structure; 40 to 70 percent angular to platy gravels and cobbles (some stones) by volume; slightly sticky, slightly plastic; pH ranges from 5.8 to 6.3; 18 to 72 inches thick.

MAPPING UNIT R7

Mapping unit R7 consists dominantly of landtype R7 and minor amounts of landtypes M8, R3, and R2. Landtype R7 is similar to landtype R2 with the exceptions of vegetation and slightly poorer drainage than R2.

Landtype R7 has moderately deep to deep soils, derived from a thin to moderately thick layer of ash over residuum from rhyolite tuff and rhyolite. Surface soils have loamy sands, sandy loams, and loam textures. Subsoils have nongravelly to very gravelly loam and clay loam textures.

Bedrock is hard, slightly to moderately fractured, pinkish rhyolite. It is competent. Depth to bedrock ranges from 20 to 60 inches.

Typically, landtype R7 occurs on all aspects of gentle to moderately steep upland flats. Slope gradients are commonly less than 15 percent but range to 30 percent.

This landtype ranges in elevation from 5,000 to 6,000 feet and supports the community type of lodgepole pine - pinegrass - grouse huckleberry.

The soil is moderately well to well drained. Permeability is rapid in the surface soils and moderate to slow in the subsoils.

Range of Profile Characteristics of Soil R7

Litter: Needles, leaves, twigs, and decomposing organic matter; 1 to 3 inches thick.

Surface Layers: Dark brown to strong brown, loamy sands, sandy loams, and loams; structureless to weak, fine, granular structure; 5 to 10 percent fine pumice gravels by volume; nonsticky, nonplastic; pH ranges from 5.8 to 6.5; 14 to 24 inches thick.

Subsoil Layers: Yellowish red to brown, gravelly to very gravelly loams and clay loams; weak to moderate, very fine to fine, subangular blocky structure; 40 to 70 percent angular to platy gravels and cobbles by volume; slightly sticky, nonplastic to slightly plastic; pH ranges from 5.8 to 6.3; 18 to 40 inches thick.

MAPPING UNIT S1

This is a miscellaneous mapping unit occurring as rockland scabflats on gentle sloping basalt flows in mountain upland positions. Bedrock consists of the Columbia River basalts. Slope gradients usually are less than 15 percent. Vegetation is very sparse consisting of scabland type. Dominant vegetation consists of Sandberg bluegrass, one-spike oatgrass, bighead clover, biscuitroots, and stiff sagebrush. Elevation ranges from 4,300 to 7,000 feet. Depth to bedrock is less than 4 inches.

MAPPING UNIT T2

Mapping unit T2 consists dominantly of landtype T2 and minor amounts of landtypes T6, B9, B7, and T3. Landtype T2 is similar to landtype T6 with the exceptions of vegetation and ash surface thickness.

Landtype T2 has moderately deep to very deep soils developed in volcanic ash over clayey sediments. Surface soils are thin to moderately thick with loamy sands, sandy loams, silt loams, and loams. Subsoils are moderately thick to thick, nongravelly to gravelly, with textures of clay loam, silty clay loam, and clay.

Bedrock consists of soft to moderately hard tuffaceous sedimentary rock. It is incompetent. Underlying these from a few inches to many feet are harder basalts and volcanic breccias. Depth to consolidated bedrock ranges from 26 to 144 inches.

Typically, landtype T2 occurs on concaved shaped to slightly rolling mountain sideslopes and toeslopes with northerly aspects. Areas of slump topography are associated with this landtype. Slopes are commonly less than 35 percent except for occasionally short pitches of up to 50 percent.

This landtype ranges in elevation from 4,000 to 6,500 feet and supports the community type of mixed conifer - pinegrass, ash soils in mixed conifer stages.

The soil is moderately well drained. Permeability is rapid in the surface soils and very slow in the subsoils.

Range of Profile Characteristics of Soil T2

Litter: Needles, twigs, and decomposing organic matter, 1 to 2 inches thick.

Surface Layers: Very dark grayish brown, dark brown, to yellowish brown; loamy sands, sandy loams, silt loams, and loams (slightly mixed to recent ash); single grained to weak, very fine, subangular blocky structure; 5 to 25 percent angular gravel by volume; nonsticky to slightly sticky, nonplastic; pH ranges from 5.8 to 7.0; 6 to 24 inches thick.

Subsoil Layers: Reddish brown to dark grayish brown clay loams, silty clay loams, and clays; weak to moderate, very fine to fine, subangular blocky structure grading to massive with depth; 10 to 50 percent angular to subangular gravels and cobbles by volume; sticky and plastic; pH ranges from 5.8 to 6.4; 20 to over 60 inches thick.

MAPPING UNIT T3

Mapping unit T3 consists dominantly of landtype T3 and minor amounts of landtypes B7, B6, and T8. Landtype T3 is similar to landtype T7 with the exceptions of landform and soil drainage.

Landtype T3 has moderately deep to very deep soils developed in colluvial mixtures of ash and loess over clayey sediments. Surface layers are very thin to thin, silty clay loams, loams, and silt loams. Subsoil layers are moderately thick to thick, nongravelly to gravelly, with clay loam, silty clay, and clay textures.

Bedrock consists of soft to moderately hard tuffaceous sedimentary rock. It is incompetent. Underlying these from a few inches to many feet are harder basalts and volcanic breccias. Depth to consolidated bedrock ranges from 26 to 144 inches.

Typically, landtype T3 occurs on southerly aspects of smooth to moderately dissected sideslopes and toeslopes ranging from 2 to 50 percent in gradient.

This landtype ranges in elevation from 3,400 to 6,500 feet and supports the community types of ponderosa pine - fescue, ponderosa pine - elk sedge, and mixed conifer - pinegrass, residual soils in pine dominated stages.

The soil is well drained. Permeability is moderate in the surface soils and slow to very slow in the subsoils.

Range of Profile Characteristics of Soil.T3

Litter: Needles, twigs, and decomposing organic matter, 1 to 3 inches thick.

Surface Layers: Very dark grayish brown to dusky red, silty clay loams, loams, and silt loams; 5 to 30 percent subangular gravels and cobbles by volume; weak to moderate, very fine, subangular blocky structure; slightly sticky, slightly plastic; pH 5.5 to 7.0; 6 to 18 inches thick.

Subsoil Layers: Reddish brown to yellowish brown; nongravelly to gravelly, heavy clay loams to clays; 5 to 50 percent subangular gravels and cobbles by volume; weak and moderate, fine, medium, coarse, subangular blocky structure; sticky to very sticky, plastic to very plastic; pH 6.0 to 7.8; 20 to over 60 inches thick.

MAPPING UNIT T5

Mapping unit T5 consists dominantly of landtype T5 and minor amounts of landtypes T7 and T3. Landtype T5 is similar to landtype T7 with the exceptions of vegetation and soil drainage.

Landtype T5 has moderately deep to very deep soils developed in loess and residuum of the underlying clayey sediments. Surface layers of silty clay loams, silt loams, and loams are very thin to thin and often are absent with subsoil textures exposed. Subsoil layers are moderately thick to thick clays. Yearly, large shrink-swell cracks are present.

Bedrock consists of soft to moderately hard tuffaceous sedimentary rock. It is incompetent. Underlying these from a few inches to many feet are harder basalts and breccias. Depth to consolidated bedrock ranges from 20 to 144 inches.

Typically, landtype T5 occurs on all aspects of gentle to moderately steep irregular foothill and mountain toeslope topography. Slope gradients are less than 30 percent.

This landtype ranges in elevation from 3,500 to 5,000 feet and supports the community types of ponderosa pine - wheatgrass, juniper - bunchgrass, and juniper - low sagebrush.

The soil is well drained. Permeability is moderate to slow in the surface soils and very slow in the subsoils.

Range of Profile Characteristics of Soil T5

Litter: Needles, leaves, twigs, and decomposing organic matter, 0 to 1 inch thick. Protective ground cover is usually poor. Surface gravel and cobble ranges from 0 to 30 percent.

Surface Layers: Very dark brown to dark reddish brown, silty clay loams, loams, and silt loams; weak to moderate, fine, granular structure; 0 to 20 percent subangular to angular gravel and cobble by volume; slightly sticky, slightly plastic; pH ranges from 7.5 to 8.0; 0 to 11 inches thick.

Subsoil Layers: Very dark grayish brown, dark brown, to dark reddish brown clays; moderate to strong, fine to medium, subangular blocky to massive; 0 to 10 percent gravel and cobble by volume; sticky to very sticky, very plastic; pH ranges from 7.0 to 8.0; 20 to over 46 inches thick.

MAPPING UNIT T6

Mapping unit T6 consists dominantly of landtype T6 and minor amounts of landtypes T2, B9, B7, and T3. Landtype T6 is similar to landtype T2 with the exceptions of vegetation and surface ash thickness.

Landtype T6 has deep to very deep soils developed in volcanic ash over clayey sediments. Surface soils are moderately thick ash with loamy sand, sandy loam, silt loam, and loam textures. Subsoils are moderately thick, nongravelly to gravelly, with clay loam, silty clay loam, and clay textures.

Bedrock consists of soft to moderately hard tuffaceous sedimentary rock. It is incompetent. Underlying these from a few inches to many feet are basalts and volcanic breccias. Depth to consolidated bedrock ranges from 35 to 144 inches.

Typically, landtype T6 occurs on concaved shaped to slightly rolling upland sideslopes and toeslopes with northerly aspects. Slope gradients range from 2 to 50 percent. Small slumps can be associated with this landscape.

This landtype ranges in elevation from 4,000 to 6,500 feet and supports the community types of white fir - twinflower - forb and mixed conifer - pinegrass, ash soils in fir dominant stages.

The soil is well drained. Permeability is rapid in the surface soils and slow to very slow in the subsoils.

Range of Profile Characteristics of Soil T6

Litter: Needles, twigs, and decomposing organic matter; 1 to 2 inches thick.

Surface Layers: Grayish brown to yellowish brown (dark brown to very dark grayish brown in surface 4 to 8 inches), loamy sands, sandy loams, loams, and silt loams of recent volcanic ash; 0 to 25 percent angular gravels by volume; single grained to weak, very fine, subangular blocky structure; nonsticky, nonplastic; pH ranges from 6.7 to 7.5; 15 to 36 inches thick.

Subsoil Layers: Brown to light red; nongravelly to gravelly; clay loams, silty clay loams, and clays; 10 to 50 percent angular to subangular gravels, cobbles, and stones by volume; weak to moderate, very fine to fine, subangular blocky structure; sticky, plastic; pH ranges 7.0 to 8.0; 20 to over 60 inches thick.

MAPPING UNIT T7

Mapping unit T7 consists dominantly of landtype T7 and minor amounts of landtypes T3, T2, and T5. Landtype T7 is similar to landtype T3 with the exceptions of landform and soil drainage. T7 occurs in basinal positions such as a meadow position.

Landtype T7 has moderately deep to very deep soils developed in loess and residuum of the underlying clayey sediments. Surface layers are thin to moderately thick loams, silt loams, silty clay loams. Subsoil layers are moderately thick to thick silty clays and clays.

Bedrock consists of soft to moderately hard tuffaceous sedimentary rock. It is incompetent. Underlying these from a few inches to many feet are harder basalts and breccias. Depth to consolidated bedrock ranges from 40 to 144 inches.

Typically, landtype T7 occurs on all aspects of gentle, slightly concaved to straight bench and saddle slopes in mountain upland positions. Slope gradients are generally less than 20 percent.

This landtype ranges in elevation from 4,000 to 6,000 feet and supports the community types of ponderosa pine - elk sedge, mixed conifer - pinegrass, residual soil, and mixed conifer - pinegrass, ash soils in pine dominant stages.

The soil is moderately well drained. Permeability is moderate in the surface soils and very slow in the subsoils.

Range of Profile Characteristics of Soil T7

Litter: Needles, twigs, and decomposing organic matter; 1 to 2 inches thick.

Surface Layers: Dark brown to dark reddish brown loams, silt loams, silty clay loams, and clay loams; strong, fine, crumb, moderate, very fine platy to moderate, very fine, fine, and medium subangular blocky structure; 0 to 20 percent gravel and cobble by volume; sticky to very sticky, plastic to very plastic; pH ranges from 6.6 to 7.5; 6 to 23 inches thick.

Subsoil Layers: Dark brown, very dark grayish brown to light gray, silty clays and clays; moderate to strong, very fine to moderate, subangular blocky and blocky structure; 0 to 10 percent cobble and stone by volume; sticky, plastic to very plastic; pH range from 7.5 to 8.0; 20 to over 60 inches thick.

MAPPING UNIT T8

Mapping unit T8 consists dominantly of landtype T8 and minor amounts of landtypes T3, B7, and B6. Landtype T8 is similar to landtype T2 with the exception of aspect. T8 has southerly aspects while T2 has northerly aspects.

Landtype T8 has moderately deep to very deep soils developed in volcanic ash over clayey sediments. Surface soils are thin to moderately thick with loamy sands, sandy loams, and loams. Subsoils are moderately thick to thick, nongravelly to gravelly, with textures of clay loams, silty clay loams, and clay.

Bedrock consists of soft to moderately hard tuffaceous sedimentary rock. It is incompetent. Underlying these from a few inches to many feet are harder basalts and volcanic breccias. Depth to consolidated bedrock ranges from 26 to 144 inches.

Typically, landtype T8 occurs on higher elevation concaved to slightly rolling mountain sideslopes and toeslopes with southerly aspects. Slope gradients range from 2 to 50 percent but commonly are less than 35 percent.

This landtype ranges in elevation from 5,000 to 6,500 feet and supports the community type of mixed conifer - pinegrass, ash soils in mixed conifer stages.

The soil is well drained. Permeability is rapid in the surface soils and slow to very slow in the subsoils.

Range of Profile Characteristics of Soil T8

Litter: Needles, leaves, twigs, and decomposing organic matter; 1 to 2 inches thick.

Surface Layers: Very dark grayish brown, dark brown, to yellowish brown; loamy sands, sandy loams, and loams (slightly mixed to recent ash); single grained to weak, very fine, subangular blocky structure; 5 to 25 percent angular gravel by volume; nonsticky to slightly sticky, nonplastic; pH ranges from 5.8 to 7.0; 6 to 24 inches thick.

Subsoil Layers: Reddish brown to dark grayish brown, clay loams, silty clay loams, and clays; weak to moderate, very fine to fine, subangular blocky structure grading to massive with depth; 10 to 50 percent angular to subangular gravels and cobbles by volume; sticky and plastic; pH ranges from 5.8 to 6.4; 20 to over 60 inches thick.

MAPPING UNIT U4

Mapping unit U4 consists of 70 percent or more of landtype U4 and may have inclusions of landtype N3. Landtype U4 is similar to landtype N3 with the exceptions of bedrock and depth to bedrock.

Landtype U4 has moderately deep to deep soils derived from recent volcanic ash overlying residuum. Surface layers are thin with silt loam textures. Subsoil layers are moderately thick to thick with gravelly or cobbly clay loam to clay textures. Gravel and cobble content increases with depth and ranges from 20 to 50 percent by volume.

Bedrock is composed of soft to moderately hard altered tuffs and breccias. It is massive to slightly fractured and incompetent. Depth to bedrock ranges from 24 to 72 inches.

Typically, landtype U4 occurs on all aspects of upland flats, sideslopes, and toeslopes with gradients less than 30 percent.

This landtype ranges in elevation from 3,500 to 6,200 feet. It supports ponderosa pine, Douglas-fir, and white fir with a ground cover of pinegrass and elk sedge.

The soil is moderately well to somewhat poorly drained. Permeability is rapid in the surface soil and very slow in the subsoil.

Range of Profile Characteristics of Landtype U4

Litter: Needles, leaves, and decomposing organic matter, 0 to 2 inches thick, covering 60 to 80 percent of the soil surface.

Surface Rock Fragments: 5 to 10 percent of the soil surface is angular and rounded rock fragments.

Surface Layers: Very dark grayish brown to brown silt loam; massive structure; 5 to 10 percent angular and rounded gravel and cobble by volume; nonsticky and nonplastic when wet; pH ranges from 5.6 to 6.5; 6 to 12 inches thick.

Subsoil Layers: Dark reddish brown to dark grayish brown gravelly and cobbly clay loam and clay; strong, fine to very fine, angular blocky structure; 20 to 50 percent angular and rounded gravel and cobble by volume; sticky and very plastic when wet; pH ranges from 5.6 to 6.5; 18 to 60 inches thick.

MAPPING UNIT U5

Mapping unit U5 consists of 70 percent or more of landtype U5 and may have inclusions of landtypes N6 and N7. Landtype U5 is similar to landtype N7 with the exceptions of soil texture and depth to bedrock.

Landtype U5 has shallow to moderately deep soils derived from medium textured residuum. Surface layers are thin with loam textures. Subsoil layers are very thin to thick with loam textures. Gravel and cobble content ranges from 5 to 35 percent by volume.

Bedrock can be basalt, andesite, rhyolite, or soft tuffaceous materials. Depth to bedrock ranges from 15 to 48 inches.

Typically, landtype U5 occurs on all aspects of sideslopes with gradients less than 30 percent and variable aspect.

This landtype ranges in elevation from 4,000 to 5,000 feet. It supports juniper, big sagebrush, bitterbrush, fescue, wheatgrass, and Sandberg bluegrass.

The soil is well drained. Permeability is moderate in the surface soil and moderate in the subsoil.

Range of Profile Characteristics of Landtype U5

Litter: Leaves and decomposing organic matter, 0 to 1 inch thick, covering 30 to 50 percent of the soil surface.

Surface Rock Fragments: 10 to 30 percent of the soil surface is flat and angular rock fragments.

Surface Layers: Black to very dark grayish brown loam; weak, fine to very fine, crumb structure; 5 to 30 percent angular and flat gravel and cobble; slightly sticky and slightly plastic when wet; pH ranges from 5.6 to 6.5; 10 to 15 inches thick.

Subsoil Layers: Dark brown to brown loam; moderate, fine to very fine, subangular blocky structure; 20 to 35 percent flat and angular gravel and cobble; sticky and plastic when wet; pH ranges from 5.6 to 6.5; 5 to 36 inches deep.

MAPPING UNIT V1

Mapping unit V1 consists dominantly of landtype V1 and minor amounts of landtype V8. Landtype V1 is similar to landtype Y4 with the exceptions of slope gradients and soils.

Landtype V1 has moderately deep to deep soils developed in fine colluvial material. Surface soils are thin to moderately thick loams and sandy clay loams. Subsoils are thin to moderately thick sandy clays and clays.

Bedrock is soft tuffaceous sedimentary rock with underlying harder Vestee formation rocks consisting of massive conglomerate, shales, graywacke, and volcanic sandstone. It is massive to highly fractured and competent. Depth to bedrock ranges from 20 to 50 inches.

Typically, landtype V1 occurs on all aspects of moderately dissected sideslopes of foothill drainages. Slope gradients range from 2 to 30 percent.

This landtype ranges in elevation from 4,500 to 5,500 feet and supports juniper and low site ponderosa pine with big sagebrush, bitterbrush, wheatgrass, fescue, junegrass, and Sandberg bluegrass.

The soil is well drained. Permeability is moderate in the surface soils and slow in the subsoils.

Range of Profile Characteristics of Soil V1

Litter: Needles, leaves, and twigs; scattered and up to 1 inch thick.

Surface Layers: Very dark brown to dark brown; loams and sandy clay loams; massive to weak, very fine to medium, subangular blocky structure; 5 to 10 percent, subround to round gravels by volume; slightly sticky to sticky, slightly plastic; pH of 7.5; 6-26 inches thick.

Subsoil Layers: Brown to yellowish brown; sandy clays to clays; massive to moderate, very fine to medium, subangular blocky structure; 5 to 10 percent, subround to round gravels by volume; sticky to very sticky, plastic to very plastic; pH range of 7.5 to 7.7; 6 to 24 inches thick.

MAPPING UNIT V2

Mapping unit V2 consists of 70 percent or more of landtype V2 and may have inclusions of landtypes V3, V4, and V6. Landtype V2 is similar to landtype V6 with the exceptions of volcanic ash thickness and vegetation.

Landtype V2 has shallow to moderately deep soils derived from recent volcanic ash overlying medium textured colluvium. Surface layers are thin with silt loam textures. Subsoil layers are thin to moderately thick with gravelly loam textures. Gravel and cobble content increases with depth in the subsoil layers and ranges from 35 to 50 percent by volume.

Bedrock is composed of soft to moderately hard, interbedded graywacke, shale, mudstone, and siltstone. It is highly fractured and competent. Depth to bedrock ranges from 18 to 30 inches.

Typically, landtype V2 occurs on all aspects of steep to very steep sideslopes with gradients of 30 to 70 percent.

This landtype ranges in elevation from 4,000 to 6,000 feet. It supports ponderosa pine, Douglas-fir, and white fir with a ground cover of elk sedge and pinegrass.

The soil is well drained. Permeability is rapid in the surface soil and moderate in the subsoil.

Range of Profile Characteristics of Landtype V2

Litter: Needles, leaves, and decomposing organic matter, ½ to 2 inches thick, covering 50 to 70 percent of the soil surface.

Surface Rock Fragments: 0 to 20 percent of the soil surface is flat and angular rock fragments.

Surface Layers: Very dark gray to very dark grayish brown silt loam; massive structure; can have up to 10 percent gravel and cobble by volume; nonsticky and nonplastic when wet; pH ranges from 6.0 to 7.0; 6 to 12 inches thick.

Subsoil Layers: Very dark grayish brown to brown gravelly loam; weak, fine to very fine, subangular blocky structure; 35 to 50 percent flat and angular gravel and cobble by volume; slightly sticky and slightly plastic when wet; pH ranges from 6.0 to 7.0; 12 to 24 inches thick.

MAPPING UNIT V3

Mapping unit V3 consists of 70 percent or more of landtype V3 and may have inclusions of landtypes V1, V2, and V4. Landtype V3 is similar to landtype V2 with the exceptions of lacking the thin volcanic ash surface and vegetation.

Landtype V3 has shallow to moderately deep soils derived from medium textured colluvium. Surface layers are thin with gravelly loam textures. Subsoil layers are thin with gravelly or cobbly loam textures. Gravel and cobble content increases with depth and ranges from 30 to 50 percent by volume.

Bedrock is composed of soft to moderately hard, interbedded graywacke, shale, mudstone, and siltstone. It is highly fractured and competent. Depth to bedrock ranges from 12 to 24 inches.

Typically, landtype V3 occurs on steep to very steep, southerly-facing sideslopes with gradients of 30 to 70 percent.

This landtype ranges in elevation from 4,000 to 6,000 feet. It supports ponderosa pine with a ground cover of elk sedge, wheatgrass, fescue, and Sandberg bluegrass.

The soil is well drained. Permeability is moderate in the surface soil and moderate in the subsoil.

Range of Profile Characteristics of Landtype V3

Litter: Needles, leaves, and decomposing organic matter, ¼ to 1 inch thick, covering 30 to 50 percent of the soil surface.

Surface Rock Fragments: 20 to 40 percent of the soil surface is flat and angular rock fragments.

Surface Layers: Very dark gray to dark brown gravelly loam; weak, very fine, crumb structure; 30 to 45 percent flat and angular gravel and cobble by volume; slightly sticky and slightly plastic when wet; pH ranges from 6.0 to 7.0; 6 to 10 inches thick.

Subsoil Layers: Brown to dark brown gravelly or cobbly loam; weak, fine to very fine, subangular blocky structure; 35 to 50 percent flat and angular gravel and cobble by volume; slightly sticky and slightly plastic when wet; pH ranges from 6.0 to 7.0; 6 to 14 inches thick.

MAPPING UNIT V4

Mapping unit V4 consists of 70 percent or more of landtype V4 and may have inclusions of landtypes V2, V3, and V5. Landtype V4 is similar to landtype V5 with the exceptions of soil depth and vegetation.

Landtype V4 has very shallow soils derived from medium textured residuum and colluvium. Soil layers are gravelly to very gravelly loam textures. Gravel and cobble content ranges from 35 to 60 percent by volume.

Bedrock is composed of soft to moderately hard interbedded graywacke, shale, mudstone, and siltstone. It is highly fractured and competent. Depth to bedrock ranges from 6 to 12 inches.

Typically, landtype V4 occurs on all aspects of exposed ridges and sideslopes with a gradient of 10 to 70 percent.

This landtype ranges in elevation from 4,000 to 6,000 feet. It supports juniper, mahogany, big sagebrush, ponderosa pine, with a ground cover of Sandberg bluegrass, wheatgrass, and fescue.

The soil is excessively drained with moderate permeability.

Range of Profile Characteristics of Landtype V4

Litter: Needles, leaves, and decomposing organic matter, ¼ to 1 inch thick, covering less than 30 percent of the soil surface.

Surface Rock Fragments: 30 to 60 percent of the soil surface is flat and angular rock fragments.

Surface Layers: Very dark grayish brown to brown gravelly to very gravelly loam; weak, fine to very fine, granular structure; 35 to 60 percent flat and angular gravel and cobble by volume; slightly sticky and slightly plastic when wet; pH ranges from 6.0 to 7.0; 6 to 12 inches thick.

MAPPING UNIT V5

Mapping unit V5 consists of 70 percent or more of landtype V5 and may have inclusions of landtypes V3, V4, and V7. Landtype V5 is similar to landtype V4 with the exceptions of soil depth and vegetation.

Landtype V5 has very shallow soils derived from medium textured colluvium. Soil layers are gravelly to very gravelly sandy loam textures. Gravel content ranges from 45 to 70 percent by volume.

Bedrock is composed of soft to moderately hard, interbedded graywacke, shale, mudstone, and siltstone. It is highly fractured and competent. Depth to bedrock ranges from 4 to 8 inches.

Typically, landtype V5 occurs on steep to very steep, southerly-facing sideslopes with gradients of 30 to 70 percent.

This landtype ranges in elevation from 4,000 to 6,000 feet. It supports big sagebrush, rabbitbrush, Sandberg bluegrass, wheatgrass, and fescue.

The soil is excessively drained with rapid permeability.

Range of Profile Characteristics of Landtype V5

Litter: Leaves, grass litter, and decomposing organic matter, less than ½ inch thick, covering less than 10 percent of the soil surface.

Surface Rock Fragments: 50 to 80 percent of the soil surface is flat and angular rock fragments.

Surface Layers: Very dark grayish brown to brown gravelly to very gravelly sandy loam; weak, very fine, granular structure; 45 to 70 percent flat and angular gravel and cobble by volume; nonsticky and nonplastic when wet; pH ranges from 6.0 to 7.0; 4 to 8 inches thick.

MAPPING UNIT V6

Mapping unit V6 consists of 70 percent or more of landtype V6 and may have inclusions of landtypes V2 and V4. Landtype V6 is similar to landtype V2 except for the volcanic ash thickness and vegetation.

Landtype V6 has moderately deep soils derived from recent volcanic ash overlying colluvium. Surface layers are thin with silt loam textures. Subsoil layers are thin to moderately thick with gravelly loam textures. Gravel and cobble in the subsoil ranges from 35 to 50 percent by volume.

Bedrock is composed of soft to moderately hard, interbedded graywacke, shale, mudstone, and siltstone. It is highly fractured and competent. Depth to bedrock ranges from 24 to 36 inches.

Typically, landtype V6 occurs on steep to very steep, northerly-facing sideslopes with gradients of 30 to 70 percent.

This landtype ranges in elevation from 4,000 to 6,000 feet. It supports white fir, Douglas-fir, larch, and lodgepole pine, with a ground cover of huckleberry, pinegrass, and Columbia brome.

The soil is well drained. Permeability is rapid in the surface soil and moderate in the subsoil.

Range of Profile Characteristics of Landtype V6

Litter: Needles, leaves, and decomposing organic matter, ½ to 2 inches thick, covering 70 to 90 percent of the soil surface.

Surface Rock Fragments: None

Surface Layers: Very dark grayish brown to dark brown silt loam; massive structure; nonsticky and nonplastic when wet; pH ranges from 6.0 to 7.0; 12 to 18 inches thick.

Subsoil Layers: Very dark grayish brown to brown gravelly loam; weak, fine to very fine, subangular blocky structure; 35 to 50 percent flat and angular gravel and cobble by volume; slightly sticky and slightly plastic when wet; pH ranges from 6.0 to 7.0; 12 to 24 inches thick.

MAPPING UNIT V7

Mapping unit V7 consists of 70 percent or more of landtype V7 and may have inclusions of landtypes V4 and V5. Landtype V7 is similar to landtype V5 except for slope gradient.

Landtype V7 has very shallow to shallow soils derived from residuum. Soil layers are gravelly to very gravelly sandy loam textures.

Bedrock is composed of soft to moderately hard, interbedded graywacke, shale, mudstone, and siltstone. It is highly fractured and competent. Depth to bedrock ranges from 6 to 12 inches.

Typically, landtype V7 occurs on all aspects of exposed ridgetops and toeslopes with gradients less than 30 percent.

This landtype ranges in elevation from 4,000 to 6,000 feet. It supports big sagebrush, rabbitbrush, Sandberg bluegrass, fescue, and wheatgrass.

The soil is excessively drained with rapid permeability.

Range of Profile Characteristics of Landtype V7

Litter: Leaves, grass litter, and decomposing organic matter, less than ½ inch thick, covering less than 10 percent of the soil surface.

Surface Rock Fragments: 40 to 70 percent of the soil surface is flat and angular rock fragments.

Surface Layers: Very dark grayish brown to brown gravelly to very gravelly sandy loam; weak, very fine, granular structure; 40 to 60 percent flat and angular gravel and cobble by volume; nonsticky and nonplastic when wet; pH ranges from 6.0 to 7.0; 6 to 12 inches thick.

MAPPING UNIT V8

Mapping unit V8 consists dominantly of landtype V8 and minor amounts of landtypes V3 and V2. Landtype V8 is similar to landtype P8 with the exception of geology.

Landtype V8 has shallow to moderately deep soils developed in a mixture of volcanic ash and weathered sediments. The surface soils are thin to moderately thick sandy loams. Subsoils are very thin, discontinuous, sandy clay loams lying above sedimentary bedrock.

Bedrock is soft to moderately hard Vesper formation rocks consisting of massive conglomerate, shales, graywacke, and volcanic sandstone. It is massive to highly fractured and competent. Depth to bedrock ranges from 14 to 30 inches.

Typically, landtype V8 occurs on gentle to moderately steep upland drainage sideslopes with all aspects. Slope gradients are generally less than 15 percent but range to 30 percent.

This landtype ranges in elevation from 4,500 to 5,500 feet and supports the community types of ponderosa pine - Douglas-fir, elk sedge and ponderosa pine - fescue.

The soil is well drained. Permeability is rapid in the surface soils and moderate to slow in the subsoils.

Range of Profile Characteristics of Soil V8

Litter: Needles, leaves, and twigs, 1 to 2 inches thick.

Surface Layers: Very dark brown to brown; sandy loam; moderate, fine crumb to weak, very fine, subangular blocky structure; 10 to 50 percent angular gravels by volume; slightly sticky, nonplastic; pH of 7.2; 13 to 26 inches thick.

Subsoil Layers: Brown; sandy clay loams; moderate, very fine, subangular blocky structure; 20 to 50 percent angular gravels by volume; slightly sticky, slightly plastic; pH of 7.0; 0 to 6 inches thick.

MAPPING UNIT X3

Mapping unit X3 consists dominantly of landtype X3 and minor amounts of landtypes Y4, Y3, and Y2. Landtype X3 is similar to landtype Y4 with the exceptions of soils and geology.

Landtype X3 has moderately deep to deep soils derived from fine textured colluvium. Surface soils are thin to moderately thick sandy loams, loams, and silt loams. Subsoils are moderately thick to thick clays.

Bedrock is composed of a mixture of soft to moderately hard tuffaceous sedimentary rock. Depth to bedrock ranges from 30 to 60 inches.

Typically, landtype X3 occurs on all aspects of steep, straight to concave erosional scarp slopes in soft sediments. Slope gradients range from 20 to 50 percent.

This landtype ranges in elevation from 4,300 to 5,500 feet and supports the community types of big sagebrush - bunchgrass and juniper - big sagebrush.

The soil is well drained. Permeability is moderate in the surface soils and very slow in the subsoils.

Range of Profile Characteristics of Soil X3

Litter: Leaves, twigs, and decomposing organic matter; scattered up to 1 inch thick; 5 to 10 percent of surface has flat cobble and stone.

Surface Layers: Very dark brown to dark brown; loam, very fine sandy loam, and silt loam; weak to moderate, fine to medium, subangular blocky structure; 10 to 20 percent subrounded gravels, cobbles, and stones by volume; slightly sticky, slightly plastic; pH of 8.0; 22 inches thick.

Subsoil Layers: Dark grayish brown to brown; clay; strong, medium, and fine subangular blocky to blocky structure (clay skins present); very sticky, very plastic; pH of 7.0; greater than 16 inches thick.

MAPPING UNIT X6

Mapping unit X6 consists dominantly of landtype X6 and minor amounts of landtype X7. Landtype X6 is similar to landtype X7 with the exceptions of vegetation and soil depth.

Landtype X6 has moderately deep to deep soils derived from ash overlying loess and residuum. Surface soils are thin to moderately thick (recent volcanic ash), noncobbly to very cobbly textures of sandy loams and loams. Subsoils are absent to very thin, very cobbly textures; silty clay loam, silty clay, and clay.

Bedrock is competent, moderately to highly fractured, hard basalt. Depth to bedrock ranges from 30 to 50 inches.

Typically, landtype X6 occurs on all aspects of gentle sloping upland slopes of basalt flow surface. Slope gradients are generally 2 to 15 percent.

This landtype ranges in elevation from 5,400 to 6,000 feet and supports the community type of mixed conifer - pinegrass, ash soils.

The soil is well drained. Permeability is rapid in the surface soils and slow to very slow in the subsoils.

Range of Profile Characteristics of Soil X6

Litter: Needles, leaves, twigs, and decomposing organic matter, 1 to 2 inches thick. Up to 30 percent of ground surface has cobble and stone.

Surface Layers: Dark reddish brown to dark grayish brown; loams and sandy loams; structureless to weak, very fine, subangular blocky structure; 20 to 70 percent angular cobble and stone by volume; nonsticky to slightly sticky, nonplastic to slightly plastic; pH of 7.0; 6 to 30 inches thick.

Subsoil Layers: Dark brown to dark reddish brown; clay loams and clays; weak, very fine, and medium subangular blocky structure; 20 to 70 percent angular cobble and stone by volume; sticky to very sticky, plastic; pH of 7.0; 0 to 20 inches thick.

MAPPING UNIT X7

Mapping unit X7 consists dominantly of landtype X7 and minor amounts of landtypes X6 and X8. Landtype X7 is similar to landtype X6 with the exceptions of vegetation and soil depth.

Landtype X7 has shallow to moderately deep soils derived from ash mixed with loess overlying residuum. Surface soils are very thin to thin, noncobbly to cobbly textures of fine sandy loams, very fine sandy loams, and loams. Subsoils are very thin to thin, cobbly to very cobbly textures of clay loams, silty clay loams, and clays.

Bedrock is competent, moderately to highly fractured, hard basalt. Depth to bedrock ranges from 18 to 30 inches.

Typically, landtype X7 occurs on all aspects of gentle sloping upland slopes of basalt flow surfaces. Slope gradients are generally 2 to 15 percent.

This landtype ranges in elevation from 4,300 to 5,500 feet and supports the community types of ponderosa pine - wheatgrass and ponderosa pine - fescue or an intergrade of these.

The soil is well drained. Permeability is rapid to moderate in the surface soils and slow to very slow in the subsoils.

Range of Profile Characteristics of Soil X7

Litter: Needles, leaves, twigs, and decomposing organic matter; 0 to 1 inch thick for about 30 percent of area. Cobbles and stones cover up to 5 percent of surface.

Surface Layers: Dark brown, dark reddish brown to dark grayish brown; fine sandy loams, very fine sandy loams, and loams; structureless to weak, very fine, subangular blocky structure; 10 to 50 percent angular cobbles and stones by volume; nonsticky to slightly sticky, nonplastic; pH range of 6.7 to 7.0; 12 to 17 inches thick.

Subsoil Layers: Dark brown, dark yellowish brown, to dark reddish brown; Silty clay loams, clay loams, and clays; 50 to 70 percent angular cobbles and stones by volume; sticky to very sticky, plastic; pH of 7.0; 0 to 12 inches thick.

MAPPING UNIT X8

Mapping unit X8 consists dominantly of landtype X8 and minor amounts of landtypes X9, X7, and S1. Landtype X8 is similar to landtype P4 with the exception of soil texture.

Landtype X8 has shallow to moderately deep soils derived from loess and residuum. Surface soils are thin loams, silt loams, and clay loams. Subsoils are very thin to thin clays.

Bedrock is composed of a mixture of soft to moderately hard massive tuffaceous rock, which is underlain at various depths by hard basalts. Depth to consolidated bedrock ranges from 14 to 24 inches.

Typically, landtype X8 occurs on all aspects of gentle sloping swale positions of basalt flow surfaces. Slope gradients are generally 2 to 15 percent.

This landtype ranges in elevation from 4,300 to 5,500 feet and supports the community types of low sagebrush - bunchgrass, juniper - low sagebrush, juniper - big sagebrush, and ponderosa pine - wheatgrass.

The soil is well drained. Permeability is moderate in the surface soils and very slow in the subsoils.

Range of Profile Characteristics of Soil X8

Litter: Approximately 40 to 60 percent of ground surface covered with leaves, needles, twigs, and decomposing organic matter; ½ to 2 inches thick; 5 to 20 percent cobble and stone cover.

Surface Layers: Very dark brown, very dark grayish brown, to dark brown; loams, silt loams, and clay loams; weak, very fine, subangular blocky to strong crumb structure; 2 to 20 percent subangular cobbles and stone by volume; slightly sticky, slightly plastic to plastic; pH range of 6.7 to 7.5; 7 to 20 inches thick.

Subsoil Layers: Dark brown to dark yellowish brown; clays; weak to strong, very fine to medium, subangular blocky structure; 0 to 20 percent angular stone, cobble, and gravel by volume; sticky to very sticky, plastic to very plastic; pH range of 6.7 to 8.0; 1 to 7 inches thick.

MAPPING UNIT X9

Mapping unit X9 consists dominantly of landtype X9 and minor amounts of landtypes X8, P3, P2, and P4. Landtype X9 is similar to landtype P3 with the exception of soil texture.

Landtype X9 has moderately deep soils derived primarily of tuffaceous sedimentary rock. Surface soils are very thin to thin clay loams and silty clay loams. Subsoils are thin to moderately thick clays.

Bedrock is composed of a mixture of soft to moderately hard massive tuffaceous rock which is underlain at various depths by hard basalts. Depth to consolidated bedrock ranges from 20 to 40 inches.

Typically, landtype X9 occurs on all aspects of gentle sloping swale positions of basalt flow surfaces. Slope gradients are generally 2 to 15 percent.

This landtype ranges in elevation from 4,300 to 5,500 feet and supports the community types of ponderosa pine - fescue and ponderosa pine - Douglas-fir - elk sedge. Estimated site class 5 for ponderosa pine.

The soil is moderately well drained. Permeability is slow in the surface soils and very slow in the subsoils.

Range of Profile Characteristics of Soil X9

Litter: Needles, leaves, twigs, and decomposing organic matter, ½ to 1 inch thick.

Surface Layers: Very dark brown to dark reddish brown; clay loams and silty clay loams; moderate to strong, very fine to fine crumb structure; 0 to 20 percent subangular cobbles by volume; sticky, plastic; pH range of 6.7 to 7.5; 2 to 18 inches thick.

Subsoil Layers: Very dark grayish brown, dark reddish brown, to yellowish red; clays; moderate, very fine to fine, subangular blocky structure grading to massive with increased depth; 0 to 20 percent subangular cobbles by volume; sticky to very sticky, plastic to very plastic; pH range of 7.0 to 7.5; 7 to 32 inches thick.

MAPPING UNIT Y1

Mapping unit Y1 consists dominantly of landtype Y1 and minor amounts of landtypes P5, P9, Y8, Y7, S1, and M1. Landtype Y1 is similar to landtype P5 with the exceptions of vegetation and soil depth.

Landtype Y1 has shallow to deep soils derived from mixtures of ash, loess, and residuum. Surface soils are very thin to moderately thick, sandy loams, loams, and silt loams. Subsoils are absent to thin, gravelly to very gravelly loams, silt loams, and silty clay loams.

Bedrock is competent, hard, highly fractured basalts of the Picture Gorge formation of the Columbia River group. Depth to bedrock ranges from 15 to 50 inches.

Typically, landtype Y1 occurs on all aspects at high elevations of gentle to moderately steep upland slopes. Slope gradients range from 2 to 30 percent.

This landtype ranges in elevation from 6,000 to 7,000 feet and supports the community types of alpine sagebrush - sedge and alpine fescue.

The soil is well drained. Permeability is rapid to moderate in the surface soils and moderate to slow in the subsoils.

Range of Profile Characteristics of Soil Y1

Litter: Leaves, twigs, and decomposing organic matter, 0 to 1 inch thick.

Surface Layers: Very dark brown, dark brown, to yellowish brown; sandy loams, loams, and silt loams; weak to moderate, very fine, subangular blocky structure; 10 to 20, occasionally to 50, percent angular gravels and cobbles by volume; slightly sticky, slightly plastic; pH range from 6.8 to 7.0; 4 to 30 inches thick.

Subsoil Layers: Dark brown to yellowish brown; loams, silt loams, and silty clay loams; weak to moderate, very fine, subangular blocky structure; 35 to 90 percent angular gravels, cobbles, and stones by volume; slightly sticky to sticky, slightly plastic to plastic; pH range of 6.6 to 7.0; 4 to 18 inches thick.

MAPPING UNIT Y2

Mapping unit Y2 consists dominantly of landtype Y2 and minor amounts of landtypes C5, Y4, Y3, and P2. Landtype Y2 is similar to landtype C5 with the exceptions of soil diversity and slope complexity.

Landtype Y2 has moderately deep to very deep soils derived from ash overlying or mixed with colluvium. Surface soils are thin to moderately thick, nongravelly to very gravelly and cobbly sandy loams, loams, and silt loams. Subsoils are thin to thick, gravelly and cobbly to very cobbly textures of silty clay loams, clay loams, and clays.

Bedrock is competent, hard, highly fractured basalts of the Picture Gorge formation of the Columbia River group. Depth to bedrock ranges from 20 to 80 inches.

Typically, landtype Y2 occurs on northerly aspects of steep to very steep slopes of plateau drainages and lava flow scarps. Slopes are slightly convex to slightly concave with occasional rock outcrops. Slope gradients are commonly 30 to 50 percent with some up to 70 percent.

This landtype ranges in elevation from 5,000 to 6,000 feet and supports the community types of white fir - twinflower - forb and mixed conifer - pinegrass, ash soils in a fir dominated stage.

The soil is well drained. Permeability is rapid in the surface soils and moderate to slow in the subsoils.

Range of Profile Characteristics of Soil Y2

Litter: Needles, leaves, twigs, and decomposing organic matter, 1 to 3 inches thick.

Surface Layers: Dark brown, dark yellowish brown, to dark reddish brown; sandy loams, loams, and silt loams; structureless to weak, very fine, subangular blocky structure; 10 to 70 percent angular gravels, cobbles, and stones by volume; nonsticky to slightly sticky, nonplastic to slightly plastic; pH range of 6.1 to 7.0; 20 to 50 inches thick.

Subsoil Layers: Dark brown, dark grayish brown, to dark yellowish brown; sandy clay loams, clay loams, silty clay loams, and clays; massive to moderate, very fine subangular blocky structure; 40 to 90 percent, angular gravels, cobbles, and stones by volume; pH range of 6.8 to 7.2; 8 to 58 inches thick.

MAPPING UNIT Y3

Mapping unit Y3 consists dominantly of landtype Y3 and minor amounts of landtypes Y4, P8, P5, and C7. Landtype Y3 is similar to landtype Y4 with the exception of vegetation. Y3 is also similar to P8 with the exception of slope gradient.

Landtype Y3 has shallow to moderately deep soils derived from loess and colluvium. Surface soils are thin, nongravelly to gravelly textures of loams and silt loams. Subsoils are thin to moderately thick, gravelly to very gravelly textures of clay loams and clays.

Bedrock is competent, hard, highly fractured basalts of the Picture Gorge formation of the Columbia River group. Depth to bedrock ranges from 18 to 40 inches.

Typically, landtype Y3 occurs on southerly aspects of steep to very steep sideslopes of plateau drainages and lava flow scarps. The slopes are usually straight and slightly to moderately dissected. Slope gradients range from 30 to 70 percent.

This landtype ranges in elevation from 4,300 to 6,000 feet and supports the community types of ponderosa pine - fescue, ponderosa pine - Douglas-fir - elk sedge, mixed conifer - pinegrass, residual soils in a pine dominated stage.

The soil is well drained. Permeability is moderate in the surface soils and slow to very slow in the subsoils.

Range of Profile Characteristics of Soil Y3

Litter: Needles, leaves, twigs, and decomposing organic matter, ½ to 3 inches thick.

Surface Layers: Dark reddish brown, reddish brown, to dark brown; loams and silt loams; weak, fine crumb to very fine, subangular blocky structure; 10 to 35 percent angular gravels and cobbles by volume; slightly sticky, nonplastic to plastic; pH range of 6.8 to 7.2; 7 to 16 inches thick.

Subsoil Layers: Dark reddish brown, reddish brown, to yellowish red; clay loams and clays; moderate, very fine, to fine, subangular blocky structure; 35 to 90 percent angular gravels and cobbles by volume; sticky, plastic; pH range of 7.0 to 7.2; 8 to 20 inches thick.

MAPPING UNIT Y4

Mapping unit Y4 consists dominantly of landtype Y4 and minor amounts of landtypes Y3 and P8. Landtype Y4 is similar to landtype Y3 with the exceptions of vegetation and soil depth to bedrock.

Landtype Y4 has shallow to moderately deep highly variable soils derived from loess mixed with colluvium. Surface soils are very thin to thin, nongravelly to gravelly, textured loams, silt loams, and clay loams. Subsoils are lacking to thin, nongravelly to very gravelly textures of clay loams and clays.

Bedrock is competent, hard, highly fractured basalts of the Picture Gorge formation of the Columbia River group. Depth to bedrock ranges from 12 to 40 inches.

Typically, landtype Y4 occurs on all but generally on southerly aspects of steep to very steep sideslopes of plateau drainages and lava flow scarps. Slopes are moderately dissected and slope gradients range from 30 to 70 percent.

This landtype ranges in elevation from 4,500 to 6,000 feet and supports the community types of bunchgrass on deep soils, steep slopes, juniper - low sage, low sagebrush - bunchgrass, and ponderosa pine - wheatgrass.

The soil is well drained. Permeability is moderate to slow in the surface soils and slow to very slow in the subsoils.

Range of Profile Characteristics of Soil Y4

Litter: 20 to 30 percent of surface area has needles, leaves, twigs, and decomposing organic matter, ½ to 1 inch thick.

Surface Layers: Very dark brown to dark reddish brown; loams, silt loams, and clay loams; moderate to strong, fine crumb to weak, very fine, subangular blocky structure; 5 to 50 percent angular and platy gravels by volume; slightly sticky to sticky, slightly plastic to plastic; pH range of 7.0 to 7.8; 3 to 22 inches thick.

Subsoil Layers: Dark brown to brown; clay loams and clays; moderate to strong, very fine and fine, subangular blocky structure; 10 to 70 percent angular to platy gravels, cobbles, and stones by volume; sticky to very sticky, plastic to very plastic; pH range of 7.0 to 7.8; 0 to 18 inches thick.

MAPPING UNIT Y7

Mapping unit Y7 consists dominantly of landtype Y7 and minor amounts of landtypes Y1, P9, Y8, P5, and M1. Landtype Y7 is similar to landtype P9 with the exceptions of drainage, vegetation, and soils. Y7 soils will be seasonally wet.

Landtype Y7 has shallow to moderately deep soils derived from loess and residuum. Surface soils are very thin, fine sandy loams, loams, and silt loams. Subsoils are thin to moderately thick, nongravelly to very gravelly textures of silty clay loams, fine sandy clay loams, and clay loams.

Bedrock is competent, hard, highly fractured basalts of the Picture Gorge formation of the Columbia River group. Depth to bedrock ranges from 17 to 40 inches.

Typically, landtype Y7 occurs on all aspects of gentle slopes in swale positions of upper elevational plateau flats. Slope gradients range from 2 to 25 percent but commonly are less than 10 percent. These soils are in runoff positions of adjacent lands.

This landtype ranges in elevation from 5,500 to 6,500 feet and supports no clearly recognized community types, but there appears to be variants of mixed conifer - pinegrass, residual soils, and lodgepole pine - pinegrass - grouse huckleberry.

The soil is moderately well drained. Permeability is moderate in the surface soils and slow in the subsoils.

Range of Profile Characteristics of Soil Y7

Litter: Needles, leaves, twigs, and decomposing organic matter, ½ to 2 inches thick.

Surface Layers: Dark reddish brown to dark brown, fine sandy loams, loams, and silt loams, very fine crumb to moderate platy structure; 0 to 10 percent angular gravels and cobbles by volume; nonsticky to sticky, nonplastic to plastic; pH of 6.0 to 7.0; 1 to 6 inches thick.

Subsoil Layers: Dark brown to olive brown; sandy clay loams, silty clay loams, and clay loams, massive to weak, very fine subangular blocky structure; 10 to 60 percent angular gravels and cobbles by volume; sticky to very sticky, plastic; pH range of 6.5 to 6.8; 15 to 32 inches thick.

MAPPING UNIT Y8

Mapping unit Y8 consists dominantly of landtype Y8 and minor amounts of landtypes Y1, P9, Y7, P5, and M1. Landtype Y8 is similar to Landtype P9 with the exceptions of elevation and vegetation.

Landtype Y8 has moderately deep to deep soils derived from ash overlying loess and residuum. Surface soils are thin to moderately thick, very fine sandy loams and silt loams. Subsoils are thin to moderately thick loams and silt loams.

Bedrock is competent, hard, highly fractured basalts of the Picture Gorge formation of the Columbia River group. Depth to bedrock ranges from 30 to 50 inches.

Typically, landtype Y8 occurs on all aspects of gentle to moderately steep slopes of high elevation plateau flats and short lava flow scarps. Slope gradients range from 2 to 30 percent.

This landtype ranges in elevation from 6,000 to 6,500 feet and supports the community types of subalpine fir - grouse huckleberry and lodgepole pine - grouse huckleberry.

The soil is well drained. Permeability is rapid in the surface soils and moderate in the subsoils.

Range of Profile Characteristics of Soil Y8

Litter: Needles, leaves, twigs, and decomposing organic matter, 1 to 2 inches thick.

Surface Layers: Dark brown to dark reddish brown; very fine sandy loam to silt loam; structureless to weak, very fine, subangular blocky structure; 5 to 10 percent fine pumice and angular gravels by volume; nonsticky to slightly sticky, nonplastic; pH of 6.0 to 6.5; 10 to 24 inches thick.

Subsoil Layers: Reddish brown; loams and silt loam; structureless to weak, very fine subangular blocky structure; 5 to 20 percent angular gravels, cobbles, and stones by volume; slightly sticky, nonplastic; pH of 6.5 to 6.7; 20 to 26 inches thick.

MAPPING UNIT Y9

Mapping unit Y9 consists dominantly of landtype Y9 and minor amounts of landtypes Y3, Y4, Y1, and P5. Landtype Y9 is similar to landtype Y3 with the exceptions of vegetation type and climatic conditions due to elevation and cold pockets.

Landtype Y9 has shallow to moderately deep soils derived from loess and colluvium. Surface soils are thin, sometimes gravelly, sandy loams, loams, and silt loams. Subsoils are thin to moderately thick, gravelly and cobbly textures of loams and clay loams.

Bedrock is competent, hard, highly fractured basalts of the Picture Gorge formation of the Columbia River group. Depth to bedrock ranges from 18 to 40 inches.

Typically, landtype Y9 occurs on southerly aspects of upper intermediate elevations on moderately steep to steep plateau drainages and lava flow scarps. Slope gradients are commonly 20 to 50 percent.

This landtype ranges in elevation from 5,500 to 6,500 feet and supports the community types of ponderosa pine - Douglas-fir - elk sedge and mixed conifer - pinegrass, residual soils in mixed conifer stages.

The soil is well drained. Permeability is moderate in the surface soils and moderate in the subsoils.

Range of Profile Characteristics of Soil Y9

Litter: Needles, leaves, twigs, and decaying organic matter, 1 to 3 inches thick.

Surface Layers: Dark reddish brown; sandy loams, loams, and silt loams; weak to moderate, fine and medium crumb to weak, very fine, subangular blocky structure; 0 to 40 percent angular gravels and cobbles by volume; nonsticky to slightly sticky, nonplastic to slightly plastic; pH range 6.0 to 6.7; 4 to 15 inches thick.

Subsoil Layers: Dark brown, reddish brown, to yellowish brown, gravelly and cobbly loams and clay loams; weak to moderate, very fine, subangular blocky structure; 40 to 50 percent angular gravels and cobbles by volume; slightly sticky to sticky, slightly plastic to plastic; pH range 6.5 to 7.0; 11 to 24 inches thick.

LEGEND OF MAPPING UNIT COMPLEXES

SYMBOL	COMPONENTS AND APPROXIMATE PERCENTAGES		
A12	A1 - 50%	A2 - 50%	
B45	B4 - 50%	B5 - 50%	
B47	B4 - 60%	B7 - 40%	
B49	B4 - 60%	B9 - 40%	
B56	B5 - 60%	B6 - 40%	
B74	B7 - 60%	B4 - 40%	
B79	B7 - 60%	B9 - 40%	
B84	B8 - 50%	B4 - 50%	
B89	B8 - 50%	B9 - 50%	
C58	C5 - 40-60%	C8 - 40-60%	
C76	C7 - 40-60%	C6 - 40-60%	
C78	C7 - 40-60%	C8 - 40-60%	
E34	E3 - 50%	E4 - 50%	
E36	E3 - 60%	E6 - 40%	
E81	E8 - 50%	E1 - 30%	J0 - 20%
J1E	J1 - 70%	E6 - 30%	
J70	J7 - 70%	J0 - 30%	
L21	L2 - 60%	L1 - 40%	
L26	L2 - 60%	L6 - 40%	
L31	L3 - 60%	L1 - 40%	
L6M	L6 - 40%	L2 - 30%	M2 - 30%
L81	L8 - 60%	L1 - 40%	
L87	L8 - 50%	L7 - 50%	
M13	M1 - 50%	M3 - 50%	
N13	N1 - 40-60%	N3 - 40-60%	

SYMBOL	COMPONENTS AND APPROXIMATE PERCENTAGES	
N36	N3 - 40-60%	N6 - 40-60%
N37	N3 - 40-60%	N7 - 40-60%
N45	N4 - 40-60%	N5 - 40-60%
N52	N5 - 40-60%	N2 - 40-60%
N54	N5 - 40-60%	N4 - 40-60%
N65	N6 - 40-60%	N5 - 40-60%
N67	N6 - 40-60%	N7 - 40-60%
N78	N7 - 40-60%	N8 - 40-60%
P12	P1 - 50%	P2 - 50%
P19	P1 - 60%	P9 - 40%
P32	P3 - 60%	P2 - 40%
P35	P3 - 60%	P5 - 40%
P38	P3 - 50%	P8 - 50%
P45	P4 - 60%	P5 - 40%
P53	P5 - 60%	P3 - 40%
P54	P5 - 60%	P4 - 40%
P58	P5 - 60%	P8 - 40%
P5Y	P5 - 60%	Y1 - 40%
P85	P8 - 60%	P5 - 40%
P9M	P9 - 60%	M1 - 40%
Q13	Q1 - 40-60%	Q3 - 40-60%
Q16	Q1 - 40-60%	N6 - 40-60%
Q17	Q1 - 40-60%	Q7 - 40-60%
Q18	Q1 - 40-60%	Q8 - 40-60%
Q21	Q2 - 40-60%	Q1 - 40-60%
Q24	Q2 - 40-60%	Q4 - 40-60%
Q25	Q2 - 40-60%	N5 - 40-60%
Q32	Q3 - 40-60%	Q2 - 40-60%

SYMBOL	COMPONENTS AND APPROXIMATE PERCENTAGES		
Q37	Q3 - 40-60%	Q7 - 40-60%	
Q42	Q4 - 40-60%	Q2 - 40-60%	
Q75	Q7 - 40-60%	Q5 - 40-60%	
Q84	Q8 - 40-60%	Q4 - 40-60%	
R14	R1 - 60%	R4 - 40%	
R24	R2 - 60%	R4 - 40%	
R27	R2 - 60%	R7 - 40%	
T26	T2 - 70%	T6 - 30%	
T2B	T2 - 60%	B9 - 40%	
T2M	T2 - 50%	M2 - 50%	
T3B	T3 - 60%	B7 - 40%	
T6B	T6 - 40%	B9 - 40%	T2 - 20%
T75	T7 - 60%	T5 - 40%	
T7M	T7 - 60%	M2 - 40%	
TB8	T8 - 60%	B8 - 40%	
V23	V2 - 40-60%	V3 - 40-60%	
V24	V2 - 40-60%	V4 - 40-60%	
V45	V4 - 40-60%	V5 - 40-60%	
V57	V5 - 40-60%	V7 - 40-60%	
V83	V8 - 70%	V3 - 30%	
X98	X9 - 50%	X8 - 50%	
Y17	Y1 - 60%	Y7 - 40%	
Y18	Y1 - 60%	Y8 - 40%	
Y23	Y2 - 60%	Y3 - 40%	
Y24	Y2 - 60%	Y4 - 40%	
Y34	Y3 - 50%	Y4 - 50%	
Y49	Y4 - 60%	Y9 - 40%	
Y71	Y7 - 60%	Y1 - 40%	
Y9P	Y9 - 50%	P5 - 50%	

Tables

TABLE OF SOIL CHARACTERISTICS OF MODAL SITE

Location - Legal description to nearest one-fourth quarter section.

Depth of Soil to Bedrock - Distance from soil surface to consolidated, unweathered bedrock. Depth is in inches.

Depth to Restrictive Layer in the Soil - Distance from soil surface to a layer in the soil that is highly restrictive to drainage, water transmission, or root growth. Usually this is a soil stratification layer, but it may be bedrock. If it is bedrock, depth must be the same as recorded under depth to bedrock. A restrictive layer is generally not a genetic soil horizon except in old soils that have developed claypan, hardpan, or cemented horizons. Depth is in inches.

Litter - Total depth in inches of decomposed and undecomposed organic matter.

Surface Rock - Estimated percentage of the total rock fragments (greater than 3/4 inch) exposed on the soil surface.

Soil Layer and Thickness - Each soil layer is a homogeneous layer of soil material. Soil layers are described when soil characteristics change significantly and have definite effects on management. Each layer may result from stratification or soil formation processes. Thickness of each soil layer in inches.

Color - Stated in narrative Munsel notations for each soil layer. Colors are taken of moist crushed soil. Mottling is noted, if present, especially in subsoil layers.

Texture* - Relative proportions of sand (2.0 mm - 0.05 mm), silt (.05 mm - .002 mm), and clay (less than .002 mm). Standard USDA textural classes are used for each soil layer. Textures classifications are modified when the content of rock fragments (greater than 2 mm) in the soil exceed 35 percent by volume. The following rock fragment classes are used.

0-35%	= Not noted
35-50%	= Gravelly, cobbly, or stony
50-80%	= Very gravelly, very cobbly, or very stony
Greater than 80%	= Extremely gravelly, extremely cobbly, or extremely stony (See below for gravel, cobble, or stone size classes.)

Rock Fragment Quantity, Size, and Shape* - Percent by volume occupied by consolidated fragments larger than sand size (larger than 2 mm).

Size Classes - Gravel, 2 mm - 3 inches; cobble, 3 inches to 10 inches; stone, greater than 10 inches.

Shape Classes - Round, thin, flat, subangular, subround, angular, blocky, etc.

Percent - Percent by volume.

* Standard USDA Handbook 18 definitions. See glossary for additional information about soil texture.

Rock Fragment Classes - Used as an adjective to textural classes. Includes gravel, cobble, and stone sizes.

0-35 percent - Not noted
35-50 percent - Gravelly, cobbly, or stony
50-80 percent - Very gravelly, very cobbly, or very stony
80+ percent - Extremely gravelly, extremely cobbly, or extremely stony

Structure* - Includes grade, size, and type of structure for each soil layer. If no structure exists, then the soil is massive or single grained. Concretions or shot are recorded if present. Applies to aggregate structural units (aggregates and peds).

Grade - Degree of aggregation and expression of the differential between cohesion within aggregates and adhesion between aggregates.

Weak - Indistinct peds, barely observable in place.

Moderate - Distinct peds, moderately durable and evident.

Strong - Distinct peds in place, durable.

Size - Refers to size of aggregates according to five size classes and type of structure:

Very Fine or Very Thin: Platy, granular, and crumb structure, less than 1 mm; prismatic and columnar structure, less than 10 mm; angular and subangular blocky structure, less than 5 mm.

Fine or Thin: Platy, granular, and crumb structure, 1 to 2 mm; prismatic and columnar structure, 10 to 20 mm; angular and subangular blocky structure, 5 to 10 mm.

Medium: Platy, granular, and crumb structure, 2 to 5 mm; prismatic and columnar structure, 20 to 50 mm; angular and subangular blocky structure, 10 to 20 mm.

Coarse or Thick: Platy, granular, and crumb structure, 5 to 10 mm; prismatic and columnar structure, 50 to 100 mm; angular and subangular blocky structure, 20 to 50 mm.

Very Coarse or Very Thick: Platy, granular, and crumb structure, greater than 10 mm; prismatic and columnar structure, greater than 100 mm; angular and subangular blocky structure, greater than 50 mm.

* Standard USDA Handbook 18 definitions.

Type - Refers to relative shape of individual aggregates. There are four primary basic shapes.

Platy - Soil particles arranged around a plane, generally horizontal.

Prism-like - Soil particles arranged around a vertical line and bounded by relatively flat surface (prismatic, columnar).

Block-like - Soil particles arranged around a point and bounded by flat or rounded surfaces (angular blocky, subangular blocky).

Spheroidal - Soil particles arranged around a point and bounded by curved or very irregular surface (granular, crumb).

Structureless - No observable aggregation or no definite orderly arrangement of natural lines of weakness.

Massive - The soil material is coherent.

Single-grain - The soil material is incoherent.

Permeability - Water or air movement in and through the soil material. The classes are based on soil texture, rock fragment content, porosity, and bulk density.

Class:

Very slow - Generally fine textured soils - clay. Less than .05 inch/hour.

Slow - Generally moderately fine textured soils - clay loams and silty clay loams. .05 inch/hour to 1 inch/hour.

Moderate - Generally medium textured soils - loams, silt loams. 1 inch/hour to 5 inches/hour.

Rapid - Generally moderately coarse textured soils - sandy loams, gravelly loams. 5 inches/hour to 20 inches/hour.

Very rapid - Very porous soils. Generally coarse textured soils - sands and gravels. Greater than 20 inches/hour.

Consistency* - Degree of cohesion and adhesion as indicated by the resistance of the soil aggregate to deformation or rupture under various moisture conditions.

* Standard USDA Handbook 18 definitions.

Dry:

Loose - Noncoherent.

Soft - Easily crushes to powder or single grain.

Slightly hard - Easily broken between thumb and forefinger.

Hard - Can be broken in the hands without difficulty but difficult to break between thumb and forefinger.

Very hard - Can be broken in hands without difficulty.

Extremely hard - Cannot be broken in hands.

Moist:

Loose - Noncoherent.

Very friable - Crushes under gentle pressure.

Friable - Crushes easily under gentle to moderate pressure between thumb and forefinger.

Firm - Crushes under moderate pressure between thumb and forefinger.

Very firm - Crushes under strong pressure; barely crushable between thumb and forefinger.

Extremely firm - Crushes under very strong pressure; cannot be crushed between thumb and forefinger.

Wet:

Stickiness is measured by pressing wet soil between fingers.

Nonsticky - Practically no adherence when pressure is released.

Slightly sticky - After pressure, soil adheres to both thumb and forefinger but comes off one rather cleanly. Does not stretch appreciably.

Sticky - After pressure, soil adheres to both thumb and forefinger and tends to stretch somewhat before pulling apart from either digit.

Very sticky - After pressure, soil adheres strongly to both digits and is markedly stretched when they are separated.

Plasticity is measured by rolling wet soil and observing wire:

Nonplastic - No wire is formable.

Slightly plastic - Wire forms, but soil mass easily deformed.

Plastic - Wire forms, moderate pressure required to deform soil mass.

Very plastic - Wire forms, much pressure required to deform soil mass.

pH - Intensity of soil acidity or alkalinity expressed on a scale of from 1 to 14:

Extremely acid - below 4.5

Strongly acid - 4.6 to 5.5

Slightly acid - 5.6 to 6.4

Neutral - 6.5 to 7.3

Slightly alkaline - 7.4 to 8.4

Strongly alkaline - 8.5 to 9.0

Very strongly alkaline - above 9.0

TABLE OF SOIL CHARACTERISTICS OF MODAL SITE

LANDTYPE NO.	LOCATION OF MODAL SITE	DEPTH TO BEDROCK (INCHES)	DEPTH TO RESTRICTIVE LAYER (INCHES)	LITTER (INCHES)	SURFACE ROCK (%)	SOIL LAYER AND THICKNESS (INCHES)	COLOR (MOIST)	TEXTURE	ROCK FRAGMENTS		
									SIZE	SHAPE	%
A1	A miscellaneous landtype with no modal soil site identified.										
A2	A miscellaneous landtype with no modal soil site identified.										
A4	A miscellaneous landtype with no modal soil site identified.										
B1	NW¼, NE¼, Sec. 12, T.12 S., R.19 E.	15	10	0 - ½	50	1. 0 - 2 2. 2 - 10 3. 10 - 15	Dark grayish brown Very dark grayish brown Dark grayish brown	Loam Very gravelly silty clay Extremely gravelly clay	Fine gravel Gravel. Gravel	Subangular Angular Angular	5 - 10 65 90
B4	NW¼, NE¼, Sec. 12, T.12 S., R.19 E.	15	10	0 - ½	50	1. 0 - 2 2. 2 - 10 3. 10 - 15	Dark grayish brown Very dark grayish brown Dark grayish brown	Loam Very gravelly silty clay Extremely gravelly clay	Fine gravel Gravel Gravel	Subangular Angular Angular	5 - 10 65 90
B5	NE¼, SE¼, Sec. 6, T.18 S., R.19 E.	14	14	0 - 1	45	1. 0 - 6 2. 6 - 14	Dark brown Dark brown	Gravelly, Very fine, Sandy loam Very gravelly clay	Gravel, Cobble Gravel, Cobble	Angular Angular	35-50 50-70
B6	SE¼, SW¼, Sec. 1, T.18 S., R.19 E.	28	28	2 - 3	0	1. 0 - 11 2. 11 - 25 3. 25 - 28	Dark brown Dark brown Dark yellowish brown	Loam Gravelly clay loam Gravelly clay	- Gravel, Cobble Gravel, Cobble	- Subangular Subangular	- 40 40
B7	NE¼, SW¼, Sec. 9, T.13 S., R.18 E.	40	25	1 - 3	0	1. 0 - 10 2. 10 - 25 3. 25 - 33 4. 33 - 40	Dark grayish brown Dark grayish brown Dark yellowish brown Dark grayish brown with light brownish gray mottling	Gravelly loam Very gravelly loam Extremely gravelly clay loam Clay	Gravel Gravel, Cobble Gravel -	Platy to angular Platy to angular Subangular to angular -	40 50 70 -

TABLE OF SOIL CHARACTERISTICS OF MODAL SITE

LANDTYPE NO.	LOCATION OF MODAL SITE	DEPTH TO BEDROCK (INCHES)	DEPTH TO RESTRICTIVE LAYER (INCHES)	LITTER (INCHES)	SURFACE ROCK (%)	SOIL LAYER AND THICKNESS (INCHES)	COLOR (MOIST)	TEXTURE	ROCK FRAGMENTS		
									SIZE	SHAPE	%
B8	NE¼, NW¼, Sec. 4, T.13 S., R.18 E.	30	30	1	0	1. 0 - 8	Very dark grayish brown	Fine sandy loam	Gravel	Subangular	5-10
						2. 8 - 30	Strong brown	Very gravelly loam	Gravel, Cobble	Subangular	55-60
B9	SE¼, SW¼, Sec. 5, T.13 S., R.18 E.	29	29	1 - 2	0	1. 0 - 1	Dark brown	Very gravelly sandy loam	Gravel	Angular	30
						2. 1 - 17	Dark brown	Very gravelly sandy loam	Gravel, Cobble	Angular	30
						3. 17 - 29	Yellowish brown	Very gravelly loam	Gravel, Cobble	Angular	50
C1/	A miscellaneous landtype with no modal soil site identified.										
C2	A miscellaneous landtype with no modal soil site identified.										
C3	A miscellaneous landtype with no modal soil site identified.										
C5	A miscellaneous landtype with no modal soil site identified.										
C6	A miscellaneous landtype with no modal soil site identified.										
C7	A miscellaneous landtype with no modal soil site identified.										
C8	A miscellaneous landtype with no modal soil site identified.										
C9	A miscellaneous landtype with no modal soil site identified.										
D1	NW¼, NE¼, Sec. 23, T.15 S., R.13 E.	32	32	Sparse	Not rated	1. 0 - 3	Very dark grayish brown	Sandy loam	-	-	-
						2. 3 - 14	Dark brown	Sandy loam	-	-	-
						3. 14 - 24	Dark brown	Sandy loam	-	-	-
						4. 24 - 32	Dark brown	Sandy loam	Gravel, Cobble	Subround	15

TABLE OF SOIL CHARACTERISTICS OF MODAL SITE

LANDTYPE NO.	LOCATION OF MODAL SITE	DEPTH TO BEDROCK (INCHES)	DEPTH TO RESTRICTIVE LAYER (INCHES)	LITTER (INCHES)	SURFACE ROCK (%)	SOIL LAYER AND THICKNESS (INCHES)	COLOR (MOIST)	TEXTURE	ROCK FRAGMENTS		
									SIZE	SHAPE	%
E1	SW¼, SW¼, Sec. 23, T.10 S., R.13 E.	25	20	Sparse	Not rated	1. 0 - 4	Very dark grayish brown	Loam	-	-	-
						2. 4 - 8	Very dark grayish brown	Loam	-	-	-
						3. 8 - 11	Dark brown	Loam	-	-	-
						4. 11 - 17	Brown	Clay loam	-	-	-
						5. 17 - 20	Brown	Loam (duripan)	-	-	-
E2	SW corner Sec. 34, T.11 S., R.14 E.	48	37	Sparse	Not rated	1. 0 - 3	Very dark grayish brown	Loam	-	-	-
						2. 3 - 8	Very dark grayish brown	Loam	Pumice, Gravel	Angular	20
						3. 8 - 23	Dark brown	Loam	Pumice, Gravel	Angular	20
						4. 23 - 37	Dark brown	Sandy loam	Pumice, Gravel	Angular	20
						5. 37 - 38	Brown	Sandy loam	Cobbles, Pumice, Gravel	Angular to subround	20
E3	SW corner Sec. 34, T.11 S., R.14 E.	48	37	Sparse	Not rated	1. 0 - 3	Very dark grayish brown	Loam	-	-	-
						2. 3 - 8	Very dark grayish brown	Loam	Pumice, Gravel	Angular	20
						3. 8 - 23	Dark brown	Loam	Pumice, Gravel	Angular	20
						4. 23 - 37	Dark brown	Sandy loam	Pumice, Gravel	Angular	20
						5. 37 - 38	Brown	Sandy loam	Cobbles, Pumice, Gravel	Angular to subround	20
E4	NE¼, SW¼, Sec. 32, T.13 S., R.15 E.	36+	23	Sparse	Not rated	1. 0 - 7	Very dark grayish brown	Loam	Gravel	Subangular	25
						2. 7 - 9	Dark grayish brown	Clay loam	Gravel	Subangular	25
						3. 9 - 20	Dark brown	Clay	Cobble, Gravel	Subangular	30
						4. 20 - 23	Dark yellowish brown	Clay	Cobble, Gravel	Subangular	30
						5. 23 - 36	Pale brown (dry)	(Duripan)	-	-	-

TABLE OF SOIL CHARACTERISTICS OF MODAL SITE

LANDTYPE NO.	LOCATION OF MODAL SITE	DEPTH TO BEDROCK (INCHES)	DEPTH TO RESTRICTIVE LAYER (INCHES)	LITTER (INCHES)	SURFACE ROCK (%)	SOIL LAYER AND THICKNESS (INCHES)	COLOR (MOIST)	TEXTURE	ROCK FRAGMENTS		
									SIZE	SHAPE	%
E5	SE¼, NW¼, Sec. 34, T.10 S., R.16 E.	40	35	Sparse	Not rated	1. 0 - 3	Black	Loam	Cobble, Gravel	Angular	25
						2. 3 - 9	Black	Loam	Cobble, Gravel	Angular	25
						3. 9 - 14	Very dark grayish brown	Cobbly clay	Cobble, Stones, Gravel	Angular	45
						4. 14 - 22	Dark brown	Clay	Cobble, Stones, Gravel	Angular	30
						5. 22 - 35	Dark brown	Cobbly clay	Cobble, Gravel, Stones	Angular	35
						6. 35 - 40	Dark brown	Very cobbly clay	Cobbles	Angular	50
E6	NE corner Section 26 T.9 S., R.13 E.	31	31	Sparse	Not rated	1. 0 - 7	Very dark grayish brown	Loam	-	-	-
						2. 7 - 11	Dark grayish brown	Loam	-	-	-
						3. 11 - 15	Dark brown	Clay loam	-	-	-
						4. 15 - 23	Dark yellowish brown	Clay loam	Gravel, Cobble	Subround, Round	10
						5. 23 - 31	Dark yellowish brown	Very cobbly clay loam	Cobble, Gravel, Stone	Subround, Round	55
E7	SW¼, SW¼ Section 23 T.10 S., R.13 E.	25	20	Sparse	Not rated	1. 0 - 4	Very dark brown	Loam	-	-	-
						2. 4 - 8	Very dark brown	Loam.	-	-	-
						3. 8 - 11	Dark brown	Loam	-	-	-
						4. 11 - 17	Brown	Clay loam	-	-	-
						5. 17 - 20	Brown	Loam	-	-	-
						6. 20 - 25	Light yellowish brown (dry)	Loam (duripan)	-	-	-
E8	SE¼, SW¼, SW¼, Section 5 T.13 S., R.14 E.	16	16	Sparse	Not rated	1. 0 - 2	Very dark grayish brown	Loam	Cobble, Gravel	Angular	10
						2. 2 - 9	Very dark grayish brown	Loam	Cobble, Gravel	Angular	10
						3. 9 - 13	Dark brown	Loam	Cobble, Gravel	Angular	10
						4. 13 - 16	Dark brown	Clay loam	Cobble, Gravel	Angular, platy	10

TABLE OF SOIL CHARACTERISTICS OF MODAL SITE

LANDTYPE NO.	LOCATION OF MODAL SITE	DEPTH TO BEDROCK (INCHES)	DEPTH TO RESTRICTIVE LAYER (INCHES)	LITTER (INCHES)	SURFACE ROCK (%)	SOIL LAYER AND THICKNESS (INCHES)	COLOR (MOIST)	TEXTURE	ROCK FRAGMENTS		
									SIZE	SHAPE	%
F1	NE¼, NW¼, Section 3 T.11 S., R.14 E.	60+	60+	Sparse	Not rated	1. 0 - 6	Very dark grayish brown	Sandy loam	-	-	-
						2. 6 - 14	Dark brown	Sandy loam	-	-	-
						3. 14 - 28	Brown	Sandy loam	-	-	-
						4. 28 - 49	Brown	Loam	Gravel	Angular	3
						5. 49 - 60	Brown	Loam	Gravel	Subround	20
F2	SW¼, SE¼, NW¼, Section 33, T.13 S., R.14 E.	60+	60+	Sparse	Not rated	1. 0 - 5	Very dark grayish brown	Sandy loam	-	-	-
						2. 5 - 14	Very dark grayish brown	Sandy loam	-	-	-
						3. 14 - 23	Dark brown	Sandy loam	-	-	-
						4. 23 - 29	Brown	Loam	Gravel, Cobble	Subround	10
						5. 29 - 38	Brown	Very gravelly sandy loam	Gravel, Cobble	Subround	60
G1	SW¼, SW¼, Section 7 T.13 S., R.28 E.	40+	15	Sparse	Not rated	1. 0 - 5	Very dark brown	Clay loam	-	-	-
						2. 5 - 11	Very dark brown	Clay	-	-	-
						3. 11 - 15	Dark brown	Clay	-	-	-
						4. 15 - 40	Brown	Silty clay loam	-	-	-
G2	SW¼, SW¼, Section 7 T.13 S., R.28 E.	40+	15	Sparse	Not rated	1. 0 - 5	Very dark brown	Clay loam	-	-	-
						2. 5 - 11	Very dark brown	Clay	-	-	-
						3. 11 - 15	Dark brown	Clay	-	-	-
						4. 15 - 40	Brown	Silty clay loam	-	-	-
G3	SW¼, SW¼, Section 7 T.13 S., R.28 E.	40+	15	Sparse	Not rated	1. 0 - 5	Very dark brown	Clay loam	-	-	-
						2. 5 - 11	Very dark brown	Clay	-	-	-
						3. 11 - 15	Dark brown	Clay	-	-	-
						4. 15 - 40	Brown	Silty clay loam	-	-	-
G7	NE¼, NW¼, NE¼ Section 25 T.8 S., R.16 E.	60+	60+	Sparse	Not rated	1. 0 - 4	Very dark brown	Silt loam	-	-	-
						2. 4 - 16	Very dark brown	Silt loam	-	-	-
						3. 16 - 25	Dark brown	Silt loam	-	-	-
						4. 25 - 33	Dark brown	Silt loam	-	-	-
						5. 33 - 39	Brown	Silt loam	Gravel	Angular	5
						6. 39 - 60	Brown	Silt loam	Gravel	Angular	15

TABLE OF SOIL CHARACTERISTICS OF MODAL SITE

LANDTYPE NO.	LOCATION OF MODAL SITE	DEPTH TO BEDROCK (INCHES)	DEPTH TO RESTRICTIVE LAYER (INCHES)	LITTER (INCHES)	SURFACE ROCK (%)	SOIL LAYER AND THICKNESS (INCHES)	COLOR (MOIST)	TEXTURE	ROCK FRAGMENTS		
									SIZE	SHAPE	%
H2	NE¼, SW¼, NW¼, Section 6 T.4 S., R.15 E.	19	19	Sparse with common stone	Not rated	1. 0 - 4	Dark grayish brown	Loam	Gravel	Angular	25
						2. 4 - 9	Dark brown	Loam	Gravel, Cobble	Angular	30
						3. 9 - 13	Dark brown	Very gravelly loam	Gravel, Cobble	Angular	50
						4. 13 - 19	Dark brown	Very gravelly loam	Gravel, Cobble	Angular	65
H3	NE¼, SW¼, NW¼, Section 6 T.4 S., R.15 E.	19	19	Sparse with common stone	Not rated	1. 0 - 4	Dark grayish brown	Loam	Gravel	Angular	25
						2. 4 - 9	Dark brown	Loam	Gravel, Cobble	Angular	30
						3. 9 - 13	Dark brown	Very gravelly loam	Gravel, Cobble	Angular	50
						4. 13 - 19	Dark brown	Very gravelly loam	Gravel, Cobble	Angular	65
J0	A miscellaneous landtype with no modal soil site identified.										
J1	NW¼, SE¼, Section 7 T.8 S., R.15 E.	7	7	Sparse	Not rated	1. 0 - 2	Dark brown	Cobbly loam	Gravel, Cobble	Angular to platy	40
						2. 2 - 4	Dark brown	Very gravelly loam	Gravel, Cobble	Angular to platy	60
						3. 4 - 7	Dark brown	Very gravelly clay loam	Gravel, Cobble	Angular to platy	60
J2	A miscellaneous landtype with no modal soil site identified.										
J3	NW¼, NE¼, SE¼, Section 13, T.13 S., R.14 E.	37 (duripan)	37	Sparse	Not rated	1. 0 - 3	Black	Loam	Cobble, Gravel	Angular	25
						2. 3 - 10	Black	Clay loam	Cobble, Gravel	Angular	30
						3. 10 - 15	Very dark gray	Cobbly clay	Cobble, Gravel	Angular	45
						4. 15 - 27	Dark grayish brown	Cobbly clay	Cobble, Gravel	Angular	45
						5. 27 - 30	Dark brown	Very cobbly silty clay	Cobble, Gravel	Angular	55
						6. 30 - 37	Yellowish brown	Very cobbly clay loam	Cobble, Gravel	Angular	60
						7. 37 - 43	Brown	Very cobbly clay loam (duripan	Cobble, Gravel	Angular	60

TABLE OF SOIL CHARACTERISTICS OF MODAL SITE

LANDTYPE NO.	LOCATION OF MODAL SITE	DEPTH TO BEDROCK (INCHES)	DEPTH TO RESTRICTIVE LAYER (INCHES)	LITTER (INCHES)	SURFACE ROCK (%)	SOIL LAYER AND THICKNESS (INCHES)	COLOR (MOIST)	TEXTURE	ROCK FRAGMENTS		
									SIZE	SHAPE	%
J5	SE¼, SW¼, NW¼, Section 24, T.10 S., R.16 E.	60+	33	Sparse	Not rated	1. 0 - 6	Black	Silt loam	Gravel	Angular	20
						2. 6 - 14	Very dark brown	Silt loam	Gravel	Angular	20
						3. 14 - 25	Dark brown	Silt loam	Gravel	Angular	30
						4. 25 - 33	Dark yellowish brown	Very gravelly silty clay loam	Cobble, Gravel	Angular	75
						5. 33 - 60	Olive brown and olive	Clay	-	-	-
J6	SE¼, SW¼, NE¼ Section 9, T.16 S., R.15 E.	40	40	Sparse with 10% stone and cobble on surface	Not rated	1. 0 - 3	Very dark grayish brown	Loam	Gravel	Angular	25
						2. 3 - 8	Very dark brown	Loam	Gravel, Cobble, Stone	Angular	30
						3. 8 - 18	Dark brown	Very gravelly loam	Gravel, Cobble, Stone	Angular	60
						4. 18 - 25	Dark brown	Very gravelly clay loam	Gravel Cobble, Stone	Angular	70
						5. 25 - 40	Brown	Very cobbly loam	Gravel, Cobble, Stone	Angular	80
L1	NE¼, SW¼, Sec. 32, T.17 S., R.20 E.	56+	19	1 - 2	0	1. 0 - 14	Brown	Very fine sandy loam	Fine gravel	Angular pumice	5-10
						2. 14 - 19	Dark brown	Gravelly silty clay loam	Gravel, Cobble	Angular	35
						3. 19 - 56+	Dark yellowish brown	Gravelly clay	Gravel, Cobble	Angular	40
L2	NW¼, NW¼, Sec. 2, T.13 S., R.23 E.	73+	31	1 - 2	10	1. 0 - 11	Dark reddish brown	Loam	Fine gravel	Angular	8-20
						2. 11 - 20	Very dark grayish brown	Loam	Fine gravel	Angular	8-20
						3. 20 - 52	Strong brown to dark brown	Gravelly clay	Gravel, Cobble	Subround	40-50
						4. 52 - 73+	Dark yellowish brown to brown	Gravelly clay	Gravel, Cobble	Subangular	40-50
L3	NE¼, NW¼, Sec. 10, T.18 S., R.20 E.	35+	19	1	10	1. 0 - 12	Very dark brown	Silt loam	Cobble	Subround	5-10
						2. 12 - 19	Very dark grayish brown	Clay (clay films)	Gravel, Cobble	Subround	30
						3 19 - 31	Dark yellowish brown	Gravelly clay (clay films)	Gravel, Cobble	Subround	35-50
						4. 31 - 35+	Strong brown	Very gravelly clay (clay films)	Gravel, Cobble	Subround	50-70

TABLE OF SOIL CHARACTERISTICS OF MODAL SITE

LANDTYPE NO.	LOCATION OF MODAL SITE	DEPTH TO BEDROCK (INCHES)	DEPTH TO RESTRICTIVE LAYER (INCHES)	LITTER (INCHES)	SURFACE ROCK (%)	SOIL LAYER AND THICKNESS (INCHES)	COLOR (MOIST)	TEXTURE	ROCK FRAGMENTS		
									SIZE	SHAPE	%
L5	NE¼, SE¼, Sec. 28, T.12 S., R.21 E.	36+	33	1½	0	1. 0 - 10	Brown	Sandy loam	Fine gravel	Angular pumice	5-10
						2. 10 - 24	Yellowish brown	Sandy loam	Fine gravel	Angular pumice	5-10
						3. 24 - 33	Light gray	Sandy loam	Fine gravel	Angular pumice	5-10
						4. 33 - 36+	Dark reddish brown	Silty clay loam	Gravel, Cobble	Angular	25
L6	SE¼, NE¼, Sec. 2, T.13 S., R.23 E.	122+	19	1	0	1. 0 - 19	Brown	Silt loam	Fine	Angular pumice	5
						2. 19 - 36	Dark yellowish brown	Gravelly clay	Cobble, Stone	Subangular	40
						3. 36 - 73	Grayish brown	Clay	Cobble, Stone	Subangular	10
						4. 73 - 122+	Light olive brown	Clay loam	Cobble, Stone	Subangular	10
L7	SE¼, NW¼, Sec. 9, T.15 S., R.20 E.	38+	12	½ - 1	0	1. 0 - 12	Very dark brown	Heavy silt loam	Cobble	Subangular	5
						2. 12 - 31	Dark to very dark grayish brown	Clay	Cobble, Gravel	Subangular to platy	15
						3. 31 - 35	Light olive brown	Clay	Cobble, Gravel	Subangular	5
						4. 35 - 38+	Light yellowish brown	Clay	Cobble, Gravel	Subangular	5
L8	NW¼, NW¼, Sec. 9, T.15 S., R.20 E.	40+	19	1 - 2	0	1. 0 - 1	Very dark brown	Fine sandy loam	Gravel, Cobble	Angular	5-10
						2. 1 - 19	Dark reddish brown	Fine sandy loam	Gravel, Cobble	Angular	5-10
						3. 19 - 30	Dark brown	Silty clay loam	Gravel, Cobble	Angular	20-30
						4. 30 - 40+	Dark yellowish brown	Silty clay loam	Gravel, Cobble	Angular	20-30
M1	A miscellaneous landtype with no modal soil site identified.										
M2	A miscellaneous landtype with no modal soil site identified.										
M3	A miscellaneous landtype with no modal soil site identified.										
M8	A miscellaneous landtype with no modal soil site identified.										

TABLE OF SOIL CHARACTERISTICS OF MODAL SITE

LANDTYPE NO.	LOCATION OF MODAL SITE	DEPTH TO BEDROCK (INCHES)	DEPTH TO RESTRICTIVE LAYER (INCHES)	LITTER (INCHES)	SURFACE ROCK (%)	SOIL LAYER AND THICKNESS (INCHES)	COLOR (MOIST)	TEXTURE	ROCK FRAGMENTS		
									SIZE	SHAPE	%
N1	NE¼, SW¼, Sec. 34, T.14 S., R.28 E.	26	12 - 18	1	5	1. 0 - 9 2. 9 - 26	Very dark grayish brown Dark brown to brown	Silt loam Cobbly clay loam	- Cobble, Gravel	- Platy, Angular	- 40
N2	NE¼, SW¼, Sec. 18, T.14 S., R.28 E.	32	18 - 36	2	Not rated	1. 0 - 15 2. 15 - 32	Dark brown Dark brown to brown	Silt loam Cobbly clay loam	- Cobble, Gravel	- Platy, Angular	- 40
N3	SW¼, SW¼, Sec. 25, T.17 S., R.29 E.	25	12 - 18	1	5	1. 0 - 8 2. 8 - 25	Very dark grayish brown Dark brown to brown	Silt loam Cobbly clay loam	Gravel, Cobble Gravel, Cobble	Platy, Angular Platy, Angular	10 45
N4	SE¼, NE¼, Sec. 14, T.12 S., R.29 E.	12	5 - 8	-	40	0 - 12	Dark brown	Gravelly loam	Gravel, Cobble	Platy, Angular	45
N5	NW¼, NE¼, Sec. 15, T.12 S., R.29 E.	18	8 - 12	½	25	1. 0 - 9 2. 9 - 18	Very dark grayish brown Dark brown to brown	Gravelly loam Cobbly clay loam	Gravel, Cobble Gravel, Cobble	Platy, Angular Platy, Angular	40 45
N6	SW¼, NE¼, Sec. 24, T.10 S., R.28 E.	18	8 - 12	½	20	1. 0 - 8 2. 8 - 18	Very dark grayish brown Dark brown to brown	Gravelly loam Cobbly clay loam	Gravel, Cobble Gravel, Cobble	Platy, Angular Platy, Angular	35 50
N7	NW¼, NW¼, Sec. 35, T.17 S., R.29 E.	11	5 - 8	-	40	0 - 11	Dark brown	Gravelly loam	Gravel, Cobble	Platy, Angular	45
N8	SE¼, NE¼ Sec. 27, T.15 S., R.27 E.	8	3 - 5	-	50	0 - 8	Dark brown	Cobbly loam	Cobble, Gravel	Platy, Angular	60
N9	NE¼, NE¼ Sec. 18, T.17 S., R.29 E.	8	3 - 5	-	50	0 - 8	Dark brown	Very gravelly loam	Gravel, Cobble	Platy, Angular	55

TABLE OF SOIL CHARACTERISTICS OF MODAL SITE

LANDTYPE NO.	LOCATION OF MODAL SITE	DEPTH TO BEDROCK (INCHES)	DEPTH TO RESTRICTIVE LAYER (INCHES)	LITTER (INCHES)	SURFACE ROCK (%)	SOIL LAYER AND THICKNESS (INCHES)	COLOR (MOIST)	TEXTURE	ROCK FRAGMENTS		
									SIZE	SHAPE	%
P1	NW¼, MW¼, Sec. 10, T.18 S., R.23 E.	30	28	1 - 2	0	1. 0 - 4	Dark yellowish brown	Sandy loam	Fine gravel	Subangular pumice	5
						2. 4 - 17	Brown	Sandy loam	Fine gravel	Subangular pumice	5
						3. 17 - 28	Dark yellowish brown	Clay loam	Cobble	Subangular	40-50
						4. 28 - 30	Dark yellowish brown	Clay	Cobble	Subangular	40-50
P2	NW¼, SW¼, Sec. 7, T.15 S., R.22 E.	37	37	2.5	0	1. 0 - 23	Dark yellowish brown	Fine sandy loam	Fine gravel	Subangular pumice	5
						2. 23 - 33	Dark brown	Silt loam	Cobble, Gravel	Subangular	20
						3. 33 - 37	Dark brown to strong brown	Cobbly silty clay loam	Cobble, Gravel	Subangular	50
P3	SW¼, SW¼, Sec. 8, T.15 S., R.22 E.	32	32	1	0	1. 0 - 14	Very dark brown	Silt loam	-	-	-
						2. 14 - 28	Dark brown	Loam	-	-	-
						3. 28 - 32	Dark brown	Silty clay loam	Cobble	Angular	5
P4	NE¼, SE¼, Section 5, T.18 S., R.20 E.	16	11	Trace	0	1. 0 - 7	Very dark brown	Silt loam	-	-	-
						2. 7 - 11	Very dark brown	Silt loam	-	-	-
						3. 11 - 16	Dark brown	Gravelly silty clay	Gravel, Cobble	Angular	50-60
P5	NW¼, NE¼, Section 15, T.15 S., R.22 E.	7	5	Trace	35	1. 0 - 5	Dark reddish brown	Silt loam	Gravel	Angular	5
						2. 5 - 7	Very dark brown	Gravelly clay	Gravel	Angular	35-50
P8	NW¼, NW¼, Section 32, T.14 S., R.24 E.	18	18	1	Trace	1. 0 - 2	Very dark brown	Fine sandy loam	Gravel, Cobble	Angular to platy	10
						2. 2 - 10	Dark reddish brown	Fine sandy loam	Gravel, Cobble	Angular to platy	10
						3. 10 - 18	Dark reddish brown	Very gravelly clay loam	Gravel	Angular	50-60
P9	SE¼, SE¼, Section 3, T.12 S., R.23 E.	30	30	2 - 3	0	1. 0 - 4	Dark brown	Fine sandy loam	Fine gravel	Subangular	5
						2. 4 - 19	Brown	Fine sandy loam	Fine gravel	Subangular	5
						3. 19 - 30	Dark yellowish brown	Cobbly silt loam	Gravel, Cobble	Subangular	40

TABLE OF SOIL CHARACTERISTICS OF MODAL SITE

LANDTYPE NO.	LOCATION OF MODAL SITE	DEPTH TO BEDROCK (INCHES)	DEPTH TO RESTRICTIVE LAYER (INCHES)	LITTER (INCHES)	SURFACE ROCK (%)	SOIL LAYER AND THICKNESS (INCHES)	COLOR (MOIST)	TEXTURE	ROCK FRAGMENTS		
									SIZE	SHAPE	%
Q1	SW¼, SE¼, Section 9, T.15 S., R.28 E.	18	8 - 12	1	40	1. 0 - 8 2. 8 - 18	Dark brown Brown to dark brown	Gravelly loam Gravelly clay loam	Gravel, Cobble Gravel, Cobble	Platy Platy	35 45
Q2	SE¼, SE¼, Section 2, T.17 S., R.32 E.	24	12 - 18	1	20	1. 0 - 8 2. 8 - 24	Dark grayish brown Brown to dark brown	Gravelly loam Gravelly loam	Gravel Gravel, Cobble	Angular, Platy Angular, Platy	35 45
Q3	NW¼, NW¼, Section 9, T.20 S., R.28 E.	12	5 - 8	-	45	1. 0 - 12	Dark brown	Gravelly loam	Gravel, Cobble	Platy	45
Q4	NE¼, SE¼, Section 20, T.20 S., R.31 E.	10	5 - 8	-	50	1. 0 - 10	Dark brown	Gravelly loam	Gravel, Cobble	Platy	45
Q7	SW¼, NW¼, Section 5, T.20 S., R.31 E.	6	3 - 5	-	70	1. 0 - 6	Dark brown	Very gravelly loam	Gravel, Cobble	Subangular platy	55
Q8	SW¼, NE¼, Section 5, T.20 S., R.28 E.	24	12 - 18	1½	5	1. 0 - 8 2. 8 - 24	Very dark grayish brown Brown to dark brown	Silt loam Gravelly clay loam	- Gravel, Cobble	- Platy	- 40
Q9	SW¼, SW¼, Section 33, T.16 S., R.33 E.	30	30	1½	5	1. 0 - 10 2. 10 - 30	Dark grayish brown Brown to dark brown	Silt loam Gravelly loam	None Gravel, Cobble	None Angular, Platy	None 40
R1	SE¼, NW¼, Sec. 28, T.12 S. R.18 E.	60	60	1	0	1. 0 - 18 2. 18 - 60	Dark brown Brown	Fine sandy loam Very gravelly loam	Gravel Gravel, Cobble	Subangular Subround	5 50
R2	SE¼, NW¼, Sec. 28, T.12 S. R.18 E.	60	60	1	0	1. 0 - 18 2. 18 - 60	Dark brown Brown	Fine sandy loam Very gravelly loam	Gravel Gravel, Cobble	Subangular Subround	5 50

TABLE OF SOIL CHARACTERISTICS OF MODAL SITE

LANDTYPE NO.	LOCATION OF MODAL SITE	DEPTH TO BEDROCK (INCHES)	DEPTH TO RESTRICTIVE LAYER (INCHES)	LITTER (INCHES)	SURFACE ROCK (%)	SOIL LAYER AND THICKNESS (INCHES)	COLOR (MOIST)	TEXTURE	ROCK FRAGMENTS		
									SIZE	SHAPE	%
R3	SW¼, NE¼, Section 29, T.12 S., R.19 E. FS Rd. 125, 4 mi. from FS Rd. 127	56+		1½	Trace	1. 0 - 2	Black	Sandy loam	Cobble, Stone	Angular to platy	5
						2. 2 - 6	Dark brown	Sandy loam	Cobble, Stone	Angular to platy	5
						3. 6 - 15	Strong brown	Sandy loam	Cobble, Stone	Angular to platy	5
						4. 15 - 56 +	Brown	Very gravelly loam	Gravel, Stone	Angular to platy	60
R4	NE¼,SW¼,Sec. 29, T.12 S., R.18 E.	10		0 - ½	50	1. 0 - 10	Dark brown	Very gravelly sandy loam	Gravel, Cobble	Subangular	60
R5	NE¼,SW¼,Sec. 24, T.12 S., R.18 E.	10		0 - ½	50	1. 0 - 10	Dark brown	Very gravelly sandy loam	Gravel, Cobble	Subangular	60
R6	SW¼, NE¼, Section 29, T.12 S., R.19 E. FS Rd. 125, 4 mi. from FS Rd. 127.	56+		1½	Trace	1. 0 - 2	Black	Sandy loam	Cobble, Stone	Angular to platy	5
						2. 2 - 6	Dark brown	Sandy loam	Cobble, Stone	Angular to platy	5
						3. 6 - 15	Strong brown	Sandy loam	Cobble, Stone	Angular to platy	15
						4. 15 - 56 +	Brown	Very gravelly loam	Gravel, Stone	Angular to platy	60
R7	SE¼,NE¼,Sec. 22, T.12 S., R.18 E.	50	5	1	0	1. 0 - 20	Dark brown	Fine sandy loam	Gravel	Subround	5
						2. 20 - 40	Yellowish red	Clay loam	Gravel	Subround	20
						3. 40 - 50	Yellowish red	Gravelly clay loam	Gravel	Subround	45
S1	A miscellaneous landtype with no modal soil site identified.										
T2	SE¼, NE¼, Sec. 22, T.13 S., R.17 E.	100	36	2 - 3	0	1. 0 - 18	Very dark grayish brown	Fine sandy loam	Fine Gravel	Subangular	5-10
						2. 18 - 36	Brown	Clay loam	Fine Gravel	Subangular	5-10
						3. 36 - 60	Reddish brown	Clay	Gravel	Subround	20
						4. 60 - 100	Reddish brown	Clay	Gravel	Subround	35
T3	SE¼, SE¼, Sec. 11, T.18 S., R.19 E.	107	12	1 - 2	0	1. 0 - 3	Very dusky red	Loam	Gravel, Cobble	Subangular	5-10
						2. 3 - 16	Dark reddish brown	Loam	Gravel, Cobble	Subangular	5-10
						3. 16 - 26	Weak red	Clay	Gravel, Cobble	Subangular	5-10
						4. 26 - 57	Reddish brown	Clay loam	Gravel	Angular	20-30
						5. 57 - 107	Light reddish brown	Clay	Gravel	Angular	20

TABLE OF SOIL CHARACTERISTICS OF MODAL SITE

LANDTYPE NO.	LOCATION OF MODAL SITE	DEPTH TO BEDROCK (INCHES)	DEPTH TO RESTRICTIVE LAYER (INCHES)	LITTER (INCHES)	SURFACE ROCK (%)	SOIL LAYER AND THICKNESS (INCHES)	COLOR (MOIST)	TEXTURE	ROCK FRAGMENTS		
									SIZE	SHAPE	%
T5	NW¼, NW¼, Sec. 11, T.18 S., R.20 E.	26+	7	0 - ½	Trace	1. 0 - 7	Very dark grayish brown	Silt loam	Cobble	Angular	5
						2. 7 - 15	Very dark grayish brown	Clay	Cobble	Angular	5
						3. 15 - 26+	Olive brown to dark reddish gray	Clay	-	-	-
T6	SE¼, NE¼, Sec. 27, T.12 S., R.21 E.	80	30	2	0	1. 0 - 30	Grayish brown	Fine sandy loam	Fine	Subangular pumice	5-10
						2. 30 - 60	Mottled pale red to light red	Gravelly silty clay	Gravel, Cobble	Subround	35-50
T7	SE¼, SW¼, Sec. 10, T.14 S., R.20 E.	48	11	1 - 2	0	1. 0 - 6	Dark brown	Loam	-	-	-
						2. 6 - 11	Dark brown	Clay loam	-	-	-
						3. 11 - 32	Dark brown tinged with dark reddish brown	Clay	Cobble	Subround	5-10
						4. 32 - 40	Light gray	Clay	-	-	-
						5. 40 - 48	Olive tinged with light gray	Silty clay	-	-	-
T8	NW¼, NW¼, Sec. 9, T.15 S., R.20 E.	80+	19	1 - 2	0	1. 0 - 1	Very dark brown	Fine sandy loam	Fine, Pumice	Angular	5-10
						2. 1 - 19	Dark reddish brown	Fine sandy loam	Gravel, Cobble	Angular	5-15
						3. 19 - 30	Dark brown	Silty clay loam	Gravel, Cobble	Angular	15-20
						4. 30 - 39	Dark yellowish brown	Silty clay loam	Gravel, Cobble	Angular	15-20
U4	NW¼, NE¼, Sec. 31, T.15 S., R.28 E.	36	12 - 18	1½	5	1. 0 - 8	Very dark grayish brown	Silt loam	-	-	-
						2. 8 - 36	Dark reddish gray	Gravelly clay	Gravel, Cobble	Subangular, Platy	35
U5	NW¼, SE¼, Sec. 12, T.18 S., R.33 E.	30	18 - 30	½	25	1. 0 - 12	Very dark brown	Loam	Gravel, Cobble	Platy	10
						2. 12 - 30	Brown to dark brown	Loam	Cobble	Platy	30
V1	NE¼, SW¼, Sec. 6, T.17 S., R.26 E.	32	32	0 - 1	0	1. 0 - 17	Very dark gray	Loam	Gravel	Subround	5
						2. 17 - 32	Brown	Sandy clay	Gravel, Stone, Cobble	Subround	5-10

TABLE OF SOIL CHARACTERISTICS OF MODAL SITE

LANDTYPE NO.	LOCATION OF MODAL SITE	DEPTH TO BEDROCK (INCHES)	DEPTH TO RESTRICTIVE LAYER (INCHES)	LITTER (INCHES)	SURFACE ROCK (%)	SOIL LAYER AND THICKNESS (INCHES)	COLOR (MOIST)	TEXTURE	ROCK FRAGMENTS		
									SIZE	SHAPE	%
V2	SW¼, NW¼, Sec. 5, T.16 S., R.32 E.	21	12 - 18	1	0	1. 0 - 8	Very dark grayish brown	Silt loam	-	-	-
						2. 8 - 13	Dark brown	Gravelly loam	Gravel, Cobble	Angular, Platy	45
V3	SE¼, NE¼, Sec. 26, T.15 S., R.29 E.	18	12 - 18	½	30	1. 0 - 9	Very dark gray	Gravelly loam	Gravel	Angular, Platy	35
						2. 9 - 18	Dark brown	Gravelly loam	Gravel, Cobble	Angular, Platy	45
V4	NE¼, NE¼, Sec. 21, T.15 S., R.31 E.	8	5 - 8	-	40	1. 0 - 8	Very dark grayish brown	Very gravelly loam	Gravel, Cobble	Angular, Platy	55
V5	NE¼, NE¼, Sec. 15, T.15 S., R.31 E.	6	3 - 5	-	50	1. 0 - 6	Very dark grayish brown	Very gravelly loam	Gravel, Cobble	Angular, Platy	60
V6	NE¼, SE¼, Sec. 10, T.15 S., R.31 E.	30	18 - 36	½	0	1. 0 - 14	Very dark grayish brown	Silt loam	-	-	-
						2. 14 - 30	Dark brown	Gravelly loam	Gravel, Cobble	Angular, Platy	45
V7	SW¼, NE¼, Sec. 10, T.19 S., R.29 E.	8	3 - 5	Trace	50	1. 0 - 8	Very dark grayish brown	Very gravelly loam	Gravel, Cobble	Angular to platy	60
V8	NW¼, SE¼, Sec. 2, T.17 S., R.26 E.	19	19	1 - 2	0	1. 0 - 3	Dark brown	Sandy loam	Very fine gravel	Angular	10
						2. 3 - 8	Dark brown	Sandy loam	Very fine gravel	Angular	10
						3. 8 - 17	Dark grayish brown	Sandy loam	Gravel	Angular	30
						4. 17 - 19 (discontinuous layer)	Brown	Sandy clay loam	Gravel	Angular	40
X3	SE¼, SE¼, Sec. 27, T.17 S., R.21 E.	38+	22	0 - .5	10	1. 0 - 22	Very dark brown	Loam	Gravel, Cobble, Stone	Subround	10-20
						2. 22 - 38	Dark grayish brown	Clay	-	-	-

TABLE OF SOIL CHARACTERISTICS OF MODAL SITE

LANDTYPE NO.	LOCATION OF MODAL SITE	DEPTH TO BEDROCK (INCHES)	DEPTH TO RESTRICTIVE LAYER (INCHES)	LITTER (INCHES)	SURFACE ROCK (%)	SOIL LAYER AND THICKNESS (INCHES)	COLOR (MOIST)	TEXTURE	ROCK FRAGMENTS		
									SIZE	SHAPE	%
X6	SE¼, NW¼, Sec. 5, T.18 S., R.21 E.	31+	31+	1 - 2	25	1. 0 - 7	Very dark grayish brown	Fine sandy loam	Fine gravels	Angular	5-10
						2. 7 - 31	Dark grayish brown	Very cobbly, fine sandy loam	Cobble, Stone	Subangular	70
X7	SW¼, NE¼, Sec. 7, T.18 S., R.21 E.	21	21	2 - 3	Trace	1. 0 - 6	Very dark brown	Loam	Stone	Angular	1-5
						2. 6 - 17	Dark brown	Loam	Cobble	Angular	10
						3. 17 - 21	Dark yellowish brown	Cobbly silty clay loam	Cobble	Angular	50
X8	SE¼, SE¼, Sec. 28, T.17 S., R.21 E.	21	14	0 - 2	10	1. 0 - 6	Very dark brown	Silt loam	Cobble, Stone	Subangular	10
						2. 6 - 14	Very dark grayish brown	Silt loam	Cobble, Stone	Subangular	10
						3. 14 - 21	Strong brown to dark brown	Clay	-	-	-
X9	SW¼, SW¼, Sec. 6, T.16 S., R.26 E.	24	12	1	0	1. 0 - 3	Very dark brown	Clay loam	-	-	-
						2. 3 - 12	Very dark brown	Clay	Gravel, Cobble	Subangular	10-20
						3. 12 - 24	Very dark grayish brown	Clay	Gravel, Cobble	Subangular	10-20
Y1	NW¼, NW¼, Sec. 11, T.13 S., R.23 E.	24	24	Trace	0	1. 0 - 5	Dark brown	Loam	Fine gravel	Subround to angular	10
						2. 5 - 18	Dark brown	Loam	Fine gravel	Subround to angular	10
						3. 18 - 24	Dark brown	Very cobbly loam	Cobble, Gravel, Stone	Platy to subangular	50-60
Y2	NW¼, NE¼, Sec. 35, T.13 S., R.20 E.	52	52	2	5	1. 0 - 4	Dark reddish brown	Sandy loam	Fine gravel	Angular	20-30
						2. 4 - 11	Dark brown	Sandy loam	Fine gravel	Angular	20-30
						3. 11 - 25	Dark brown	Very cobbly sandy loam	Cobble, Gravel	Angular	60-70
						4. 25 - 52	Dark grayish brown to dark brown	Very cobbly sandy clay loam	Cobble, Gravel	Angular	60-70

TABLE OF SOIL CHARACTERISTICS OF MODAL SITE

LANDTYPE NO.	LOCATION OF MODAL SITE	DEPTH TO BEDROCK (INCHES)	DEPTH TO RESTRICTIVE LAYER (INCHES)	LITTER (INCHES)	SURFACE ROCK (%)	SOIL LAYER AND THICKNESS (INCHES)	COLOR (MOIST)	TEXTURE	ROCK FRAGMENTS		
									SIZE	SHAPE	%
Y3	SE¼, SE¼, Sec. 10, T.14 S., R.25 E.	33	33	0 - 1	25	1. 0 - 4	Dark brown	Loam	Cobble, Gravel, Stone	Angular	20-30
						2. 4 - 13	Reddish brown	Loam	Cobble, Gravel, Stone	Angular	20-30
						3. 13 - 25	Reddish brown	Gravelly clay loam	Gravel, Cobble, Stone	Angular	40
						4. 25 - 33	Yellowish red	Extremely cobbly clay	Cobble, Stone	Angular	95
Y4	SE¼, NE¼, Sec. 15, T.14 S., R.26 E.	15	3	Trace	20	1. 0 - 3	Dark brown	Clay loam	Cobble	Subangular	15
						2. 3 - 15	Dark brown	Gravelly clay	Gravel, Cobble, Stone	Subangular	40
Y7	NW¼, NW¼, Sec. 10, T.13 S., R.23 E.	26	26	1	Trace	1. 0 - 2	Dark reddish brown	Loam	None	-	-
						2. 2 - 26	Dark brown	Clay loam	Gravel, Cobble	Subround	20-30
Y8	NW¼, SW¼, Sec. 16, T.13 S., R.21 E.	40	40	1 - 2	0	1. 0 - 4	Dark brown	Very fine sandy loam	Fine gravel	Angular	5-10
						2. 4 - 17	Dark reddish brown	Very fine sandy loam	Fine gravel	Angular	5-10
						3. 17 - 29	Reddish brown	Silt loam	Fine gravel	Angular	5-10
						4. 29 - 40	Reddish brown	Silt loam	Cobble, Gravel, Stone	Angular	20
Y9	SE¼, NW¼, Sec. 29, T.14 S., R.25 E.	34	34	1	Trace	1. 0 - 4	Dark reddish brown	Loam	Gravel, Stone	Angular	20
						2. 4 - 15	Dark reddish brown	Clay loam	Gravel, Stone	Angular	20
						3. 15 - 34	Dark reddish brown to reddish brown	Cobbly clay loam	Cobble, Stone, Gravel	Angular	45

TABLE OF SOIL CHARACTERISTICS OF MODAL SITE (CONTINUED)

LANDTYPE NO.	SOIL LAYER AND THICKNESS (INCHES)	ROCK FRAGMENT CLASS	STRUCTURE			PERMEABILITY	CONSISTENCY			pH
			GRADE	SIZE	TYPE		DRY	MOIST	WET	
A1	A miscellaneous	landtype with no modal soil site identified.								
A2	A miscellaneous	landtype with no modal soil site identified.								
A4	A miscellaneous	landtype with no modal soil site identified.								
B1	1. 0 - 2	N/A	Moderate	Very fine	Platy	Moderate	Soft	Very friable	Nonsticky, Nonplastic	7.0
	2. 2 - 10	Very gravelly	Strong	Very fine	Subangular blocky	Slow	Very hard	Very firm	Sticky, Plastic	7.0
	3. 10 - 15	Extremely gravelly	Massive	-	-	Slow	Very hard	Very firm	Sticky, Plastic	8.0
B4	1. 0 - 2	N/A	Moderate	Very fine	Platy	Moderate	Soft	Very friable	Nonsticky, Nonplastic	7.0
	2. 2 - 10	Very gravelly	Strong	Very fine	Subangular blocky	Slow	Very hard	Very firm	Sticky, Plastic	7.0
	3. 10 - 15	Extremely gravelly	Massive	-	-	Slow	Very hard	Very firm	Sticky, Plastic	8.0
B5	1. 0 - 6	Gravelly	Weak	Very fine	Subangular blocky	Moderate	Slightly firm	Friable	Slightly sticky, Slightly plastic	7.5
	2. 6 - 14	Very gravelly	Strong	Very fine	Blocky	Slow	Very hard	Very firm	Sticky, Very plastic	7.0
B6	1. 0 - 11	N/A	Weak	Fine	Granular	Moderate	Soft	Friable	Slightly sticky, Slightly plastic	6.8
	2. 11 - 25	N/A	Moderate	Very fine to moderate	Subangular blocky	Slow	Slightly hard	Firm	Sticky, Plastic	6.8
	3. 25 - 28	N/A	Strong	Very fine	Subangular blocky	Very slow	Extremely hard	Extremely firm	Sticky, Very plastic	6.8

TABLE OF SOIL CHARACTERISTICS OF MODAL SITE (CONTINUED)

LANDTYPE NO.	SOIL LAYER AND THICKNESS (INCHES)	ROCK FRAGMENT CLASS	STRUCTURE			PERMEABILITY	CONSISTENCY			pH
			GRADE	SIZE	TYPE		DRY	MOIST	WET	
B7	1. 0 - 10	Gravelly	Structureless and weak	Very fine, Fine	Granular	Moderate	Soft	Friable	Slightly sticky, Slightly plastic	7.5
	2. 10 - 25	Gravelly	Weak to moderate	Very fine	Platy to subangular	Moderate	Soft	Friable	Sticky, Slightly plastic	6.9
	3. 25 - 33	Very gravelly	Weak	Very fine	Subangular blocky	Slow	Hard	Firm	Sticky, Plastic	7.0
	4. 33 - 40	N/A	Massive	-	-	Very slow	Extremely hard	Extremely firm	Very sticky, Very plastic	7.0
B8	1. 0 - 8	N/A	Weak	Fine	Granular	Rapid	Soft	Very friable	Nonsticky, Nonplastic	6.0
	2. 8 - 30	Very gravelly	Weak	Fine	Subangular blocky	Rapid	Slightly hard	Friable	Slightly sticky, Slightly plastic	5.9
B9	1. 0 - 1	Very gravelly	Weak	Fine	Granular	Rapid	Loose	Very friable	Nonsticky, Nonplastic	6.7
	2. 1 - 17	Very gravelly	Structureless	-	-	Rapid	Loose	Very friable	Nonsticky, Nonplastic	6.4
	3. 17 - 29	Very gravelly	Weak	Very fine	Subangular blocky	Moderate	Soft	Friable	Slightly sticky, Slightly plastic	7.0
C1	A miscellaneous landtype with no modal soil site identified.									
C2	A miscellaneous landtype with no modal soil site identified.									
C3	A miscellaneous landtype with no modal soil site identified.									
C5	A miscellaneous landtype with no modal soil site identified.									
C6	A miscellaneous landtype with no modal soil site identified.									

TABLE OF SOIL CHARACTERISTICS OF MODAL SITE (CONTINUED)

LANDTYPE NO.	SOIL LAYER AND THICKNESS (INCHES)	ROCK FRAGMENT CLASS	STRUCTURE			PERMEABILITY	CONSISTENCY			pH
			GRADE	SIZE	TYPE		DRY	MOIST	WET	
C7	A miscellaneous landtype with no modal soil site identified.									
C8	A miscellaneous landtype with no modal soil site identified.									
C9	A miscellaneous landtype with no modal soil site identified.									
D1	1. 0 - 3	N/A	Weak	Very fine	Granular	Rapid	Soft	Friable	Nonsticky, Nonplastic	6.8
	2. 3 - 14	N/A	Weak	Medium	Subangular blocky	Rapid	Soft	Friable	Nonsticky, Nonplastic	6.8
	3. 14 - 24	N/A	Weak	Medium	Subangular blocky	Rapid	Hard	Friable	Slightly sticky, Slightly plastic	7.0
	4. 24 - 32	N/A	Massive	-		Rapid	Hard	Firm	Slightly sticky, Slightly plastic	7.2
E1	1. 0 - 4	N/A	Weak	Fine	Granular	Moderate	Slightly hard	Very friable	Slightly sticky, Slightly plastic	6.4
	2. 4 - 8	N/A	Weak	Fine	Granular	Moderate	Hard	Friable	Slightly sticky, Slightly plastic	6.6
	3. 8 - 11	N/A	Weak	Medium	Subangular blocky	Moderate	Hard	Friable	Slightly sticky, Slightly plastic	6.8
	4. 11 - 17	N/A	Weak	Medium	Prismatic	Slow	Hard	Firm	Sticky, Plastic	7.8
	5. 17 - 20	N/A	Weak	Medium	Subangular blocky	Very slow	Slightly hard	Friable	Slightly sticky, Slightly plastic	8.0

TABLE OF SOIL CHARACTERISTICS OF MODAL SITE (CONTINUED)

LANDTYPE NO.	SOIL LAYER AND THICKNESS (INCHES)	ROCK FRAGMENT CLASS	STRUCTURE			PERMEABILITY	CONSISTENCY			pH
			GRADE	SIZE	TYPE		DRY	MOIST	WET	
E2	1. 0 - 3	N/A	Weak	Very fine	Granular	Moderate	Loose	Very friable	Slightly sticky, Slightly plastic	7.4
	2. 3 - 8	N/A	Weak	Coarse	Prismatic and subangular blocky	Moderate	Slightly hard	Friable	Slightly sticky, Slightly plastic	7.6
	3. 8 - 23	N/A	Weak	Coarse	Prismatic and subangular blocky	Moderate	Slightly hard	Friable	Slightly sticky, Slightly plastic	7.8
	4. 23 - 37	N/A	Massive	-	-	Rapid	Slightly hard	Very friable	Nonsticky, Nonplastic	8.5
	5. 37 - 38	N/A	Massive	-	-	Rapid	Soft	Very friable	Nonsticky, Nonplastic	9.2
E3	1. 0 - 3	N/A	Weak	Very fine	Granular	Moderate	Loose	Very friable	Slightly sticky, Slightly plastic	7.4
	2. 3 - 8	N/A	Weak	Coarse	Prismatic and subangular blocky	Moderate	Slightly hard	Friable	Slightly sticky, Slightly plastic	7.6
	3. 8 - 23	N/A	Weak	Coarse	Prismatic and subangular blocky	Moderate	Slightly hard	Friable	Slightly sticky, Slightly plastic	7.8
	4. 23 - 37	N/A	Massive	-	-	Rapid	Slightly hard	Very friable	Nonsticky, Nonplastic	8.5
	5. 37 - 38	N/A	Massive	-	-	Rapid	Soft	Very friable	Nonsticky, Nonplastic	9.2

TABLE OF SOIL CHARACTERISTICS OF MODAL SITE (CONTINUED)

LANDTYPE NO.	SOIL LAYER AND THICKNESS (INCHES)	ROCK FRAGMENT CLASS	STRUCTURE			PERMEABILITY	CONSISTENCY			pH
			GRADE	SIZE	TYPE		DRY	MOIST	WET	
E4	1. 0 - 7	N/A	Weak	Thin and fine	Platy and granular	Moderate	Slightly hard	Friable	Slightly sticky, Slightly plastic	6.8
	2. 7 - 9	N/A	Moderate	Fine and moderate	Subangular blocky	Slow	Hard	Firm	Sticky, Plastic	6.6
	3. 9 - 20	N/A	Strong	Medium	Prismatic	Slow	Very hard	Very firm	Very sticky, Very plastic	7.1
	4. 20 - 23	N/A	Moderate	Medium	Blocky	Slow	Very hard	Very firm	Very sticky, Very plastic	7.6
	5. 23 - 36	N/A	Massive	-	-	Very slow	Extremely hard	-	-	8.2
E5	1. 0 - 3	N/A	Weak	Thin	Platy	Moderate	Slightly hard	Friable	Slightly sticky, Slightly plastic	6.6
	2. 3 - 9	N/A	Weak to moderate	Fine	Subangular blocky	Moderate	Hard	Friable	Slightly sticky, Slightly plastic	6.8
	3. 9 - 14	Cobbly	Strong	Medium	Subangular blocky	Slow	Very hard	Very firm	Very sticky, Very plastic	7.2
	4. 14 - 22	N/A	Strong	Medium	Subangular blocky	Slow	Very hard	Very firm	Very sticky, Very plastic	7.4
	5. 22 - 35	Cobbly	Weak	Medium	Subangular blocky	Slow	Very hard	Firm	Very sticky, Very plastic	8.0
	6. 35 - 40	Very cobbly	Massive	-	-	Slow	Very hard	Firm	Very sticky, Very plastic	8.0

TABLE OF SOIL CHARACTERISTICS OF MODAL SITE (CONTINUED)

LANDTYPE NO.	SOIL LAYER AND THICKNESS (INCHES)	ROCK FRAGMENT CLASS	STRUCTURE			PERMEABILITY	CONSISTENCY			pH
			GRADE	SIZE	TYPE		DRY	MOIST	WET	
E6	1. 0 - 7	N/A	Weak	Very fine	Granular	Moderate	Soft	Very friable	Slightly sticky, Slightly plastic	6.8
	2. 7 - 11	N/A	Weak	Medium	Subangular blocky	Moderate	Soft	Friable	Slightly sticky, Slightly plastic	7.0
	3. 11 - 15	N/A	Weak	Medium, Fine	Subangular blocky	Slow	Hard	Firm	Sticky, Slightly plastic	7.6
	4. 15 - 23	N/A	Moderate	Fine	Subangular blocky	Slow	Hard	Firm	Sticky, Plastic	7.6
	5. 23 - 31	Very cobbly	Massive	-	-	Slow	Slightly hard	Firm	Slightly sticky, Slightly plastic	8.2
E7	1. 0 - 4	N/A	Weak	Fine	Granular	Moderate	Slightly hard	Very friable	Slightly sticky, Slightly plastic	6.4
	2. 4 - 8	N/A	Weak	Fine	Granular	Moderate	Hard	Friable	Slightly sticky, Slightly plastic	6.6
	3. 8 - 11	N/A	Weak	Medium	Subangular blocky	Moderate	Slightly hard	Friable	Slightly sticky, Slightly plastic	6.8
	4. 11 - 17	N/A	Moderate	Fine	Subangular blocky	Slow	Hard	Firm	Sticky, Plastic	7.8
	5. 17 - 20	N/A	Weak	Medium	Subangular blocky	Moderate	Slightly hard	Friable	Slightly sticky, Slightly plastic	8.0
	6. 20 - 25	N/A	Massive	-	-	Very slow	-	-	-	-

TABLE OF SOIL CHARACTERISTICS OF MODAL SITE (CONTINUED)

LANDTYPE NO.	SOIL LAYER AND THICKNESS (INCHES)	ROCK FRAGMENT CLASS	STRUCTURE			PERMEABILITY	CONSISTENCY			pH
			GRADE	SIZE	TYPE		DRY	MOIST	WET	
E8	1. 0 - 2	N/A	Weak	Fine	Granular	Moderate	Slightly hard	Friable	Slightly sticky, Slightly plastic	6.8
	2. 2 - 9	N/A	Weak	Medium	Subangular blocky	Moderate	Slightly hard	Friable	Slightly sticky, Slightly plastic	7.0
	3. 9 - 13	N/A	Weak	Medium	Subangular blocky	Moderate	Hard	Friable	Sticky, Plastic	7.2
	4. 13 - 16	N/A	Weak	Medium	Subangular blocky	Slow	Hard	Friable	Sticky, Plastic	7.2
F1	1. 0 - 6	N/A	Weak	Thin	Platy	Rapid	Slightly hard	Friable	Slightly sticky, Slightly plastic	6.6
	2. 6 - 14	N/A	Weak	Coarse	Prismatic	Rapid	Slightly hard	Friable	Slightly sticky, Slightly plastic	6.6
	3. 14 - 28	N/A	Weak	Coarse	Prismatic	Rapid	Slightly hard	Friable	Slightly sticky, Slightly plastic	6.6
	4. 28 - 49	N/A	Massive	-	-	Moderate	Slightly hard	Friable	Slightly sticky, Slightly plastic	7.0
	5. 49 - 60	N/A	Massive	-	-	Moderate	Slightly hard	Friable	Slightly sticky, Slightly plastic	8.2

TABLE OF SOIL CHARACTERISTICS OF MODAL SITE (CONTINUED)

LANDTYPE NO.	SOIL LAYER AND THICKNESS (INCHES)	ROCK FRAGMENT CLASS	STRUCTURE			PERMEABILITY	CONSISTENCY			pH
			GRADE	SIZE	TYPE		DRY	MOIST	WET	
F2	1. 0 - 5	N/A	Weak	Thick	Platy	Rapid	Hard	Friable	Nonsticky, Slightly plastic	6.6
	2. 5 - 14	N/A	Weak	Medium	Subangular blocky	Rapid	Slightly hard	Very friable	Nonsticky, Slightly plastic	6.8
	3. 14 - 23	N/A	Weak	Medium	Subangular blocky	Rapid	Slightly hard	Very friable	Slightly sticky, Slightly plastic	7.0
	4. 23 - 29	N/A	Moderate	Fine	Subangular blocky	Moderate	Hard	Friable	Slightly sticky, Plastic	7.2
	5. 29 - 38	Very gravelly	Massive	-	-	Very rapid	Loose	Loose	Nonsticky, Nonplastic	8.4
G1	1. 0 - 5	N/A	Moderate	Thin	Platy	Slow	Hard	Friable	Sticky, Plastic	6.8
	2. 5 - 11	N/A	Weak to Moderate	Medium	Prismatic breaks	Very slow	Very hard	Firm	Very sticky, Very plastic	7.8
	3. 11 - 15	N/A	Moderate	Medium	Subangular blocky	Very slow	Very hard	Firm	Very sticky, Very plastic	8.4
	4. 15 - 40	N/A	Massive	-	-	Slow	Hard	Friable	Sticky, Plastic	8.4
G2	1. 0 - 5	N/A	Moderate	Thin	Platy	Slow	Hard	Friable	Sticky, Plastic	6.8
	2. 5 - 11	N/A	Weak to Moderate	Medium	Prismatic breaks	Very slow	Very hard	Firm	Very sticky, Very plastic	7.8
	3. 11 - 15	N/A	Moderate	Medium	Subangular blocky	Very slow	Very hard	Firm	Very sticky, Very plastic	8.4
	4. 15 - 40	N/A	Massive	-	-	Slow	Hard	Friable	Sticky, Plastic	8.4

TABLE OF SOIL CHARACTERISTICS OF MODAL SITE (CONTINUED)

LANDTYPE NO.	SOIL LAYER AND THICKNESS (INCHES)	ROCK FRAGMENT CLASS	STRUCTURE			PERMEABILITY	CONSISTENCY			pH
			GRADE	SIZE	TYPE		DRY	MOIST	WET	
G3	1. 0 - 5	N/A	Moderate	Thin	Platy	Slow	Hard	Friable	Sticky, Plastic	6.8
	2. 5 - 11	N/A	Weak to Moderate	Medium	Prismatic breaks	Very slow	Very hard	Firm	Very sticky, Very plastic	7.8
	3. 11 - 15	N/A	Moderate	Medium	Subangular blocky	Very slow	Very hard	Firm	Very sticky, Very plastic	8.4
	4. 15 - 40	N/A	Massive	-	-	Slow	Hard	Friable	Sticky, Plastic	8.4
G7	1. 0 - 4	N/A	Weak to weak	Thin to medium fine	Platy breaking, Granular	Moderate	Slightly hard	Very friable	Slightly sticky, Slightly plastic	6.6
	2. 4 - 16	N/A	Weak to moderate	Coarse, Medium	Prismatic breaking, Subangular blocky	Moderate	Hard	Friable	Slightly sticky, Slightly plastic	6.8
	3. 16 - 25	N/A	Weak to moderate	Medium and coarse, Medium	Prismatic breaking, Subangular blocky	Moderate	Hard	Friable	Slightly sticky, Slightly plastic	7.0
	4. 25 - 33	N/A	Weak to weak	Coarse, Medium	Prismatic breaking, Subangular blocky	Moderate	Slightly hard	Friable	Slightly sticky, Slightly plastic	6.8
	5. 33 - 39	N/A	Massive	-	-	Moderate	Slightly hard	Very friable	Slightly sticky, Slightly plastic	7.6
	6. 39 - 60	N/A	Massive	-	-	Moderate	Slightly hard	Very friable	Slightly sticky, Slightly plastic	8.2

TABLE OF SOIL CHARACTERISTICS OF MODAL SITE (CONTINUED)

LANDTYPE NO.	SOIL LAYER AND THICKNESS (INCHES)	ROCK FRAGMENT CLASS	STRUCTURE			PERMEABILITY	CONSISTENCY			pH
			GRADE	SIZE	TYPE		DRY	MOIST	WET	
H2	1. 0 - 4	N/A	Weak to weak	Thin, Fine	Platy breaking, Granular	Moderate	Slightly hard	Friable	Slightly sticky, Slightly plastic	6.9
	2. 4 - 9	N/A	Weak and moderate	Fine and medium	Subangular blocky	Moderate	Slightly hard	Friable	Slightly sticky, Slightly plastic	7.2
	3. 9 - 13	Very gravelly	Moderate	Fine and medium	Subangular blocky	Moderate	Hard	Friable	Sticky, Plastic	6.8
	4. 13 - 19	Very gravelly	Moderate	Fine and medium	Subangular blocky	Moderate	Hard	Firm	Sticky, Plastic	6.6
H3	1. 0 - 4	N/A	Weak to weak	Thin, Fine	Platy breaking, Granular	Moderate	Slightly hard	Friable	Slightly sticky, Slightly plastic	6.9
	2. 4 - 9	N/A	Weak and moderate	Fine and medium	Subangular blocky	Moderate	Slightly hard	Friable	Slightly sticky, Slightly plastic	7.2
	3. 9 - 13	Very gravelly	Moderate	Fine and medium	Subangular blocky	Moderate	Hard	Friable	Sticky, Plastic	6.8
	4. 13 - 19	Very gravelly	Moderate	Fine and medium	Subangular blocky	Moderate	Hard	Firm	Sticky, Plastic	6.6
J0	A miscellaneous landtype with no modal soil site identified.									
J1	1. 0 - 2	Gravelly	Weak to weak	Thin, Fine	Platy breaks, Granular	Moderate	Slightly hard	Friable	Slightly sticky, Slightly plastic	6.5
	2. 2 - 4	Very gravelly	Weak to weak	Thin, Fine and medium	Platy breaks, Granular	Slow	Slightly hard	Friable	Sticky, Plastic	6.8
	3. 4 - 7	Very gravelly	Moderate	Fine	Subangular blocky	Slow	Hard	Friable	Sticky, Plastic	6.9

TABLE OF SOIL CHARACTERISTICS OF MODAL SITE (CONTINUED)

LANDTYPE NO.	SOIL LAYER AND THICKNESS (INCHES)	ROCK FRAGMENT CLASS	STRUCTURE			PERMEABILITY	CONSISTENCY			pH
			GRADE	SIZE	TYPE		DRY	MOIST	WET	
J2	A miscellaneous landtype with no modal soil site identified.									
J3	1. 0 - 3	N/A	Weak to moderate	Thin, Fine	Platy breaks, Granular	Moderate	Slightly hard	Friable	Slightly sticky, Slightly plastic	6.4
	2. 3 - 10	N/A	Moderate	Very fine, Fine	Subangular blocky	Slow	Hard	Friable	Sticky, Plastic	6.6
	3. 10 - 15	Cobbly	Strong	Medium, Fine	Blocky	Very slow	Extremely hard	Very firm	Very sticky, Very plastic	6.6
	4. 15 - 27	Cobbly	Strong	Medium	Blocky	Very slow	Extremely hard	Friable	Very sticky, Very plastic	7.0
	5. 27 - 30	Very cobbly	Moderate	Medium	Subangular blocky	Very slow	Extremely hard	Friable	Sticky, Plastic	7.8
	6. 30 - 37	Very cobbly	Massive	-	-	Very slow	Very hard	Very firm	Sticky, Plastic	8.0
	7. 37 - 43	Very cobbly	Massive	-	-	Very slow to none	Very hard	Very firm	-	-
J5	1. 0 - 6	N/A	Weak to moderate	Medium, Fine	Platy breaks, Granular	Moderate	Soft	Very friable	Slightly sticky, Slightly plastic	6.2
	2. 6 - 14	N/A	Weak	Medium	Subangular blocky	Moderate	Slightly hard	Friable	Slightly sticky, Slightly plastic	6.2
	3. 14 - 25	N/A	Moderate	Medium	Subangular blocky	Moderate	Hard	Friable	Sticky, Plastic	6.0
	4. 25 - 33	Very gravelly	Moderate	Medium	Subangular blocky	Slow	Hard	Firm	Very sticky, Very plastic	6.2
	5. 33 - 60	N/A	Massive	-	-	Very slow	Very hard	Firm	Very sticky, Very plastic	-

TABLE OF SOIL CHARACTERISTICS OF MODAL SITE (CONTINUED)

LANDTYPE NO.	SOIL LAYER AND THICKNESS (INCHES)	ROCK FRAGMENT CLASS	STRUCTURE			PERMEABILITY	CONSISTENCY			pH
			GRADE	SIZE	TYPE		DRY	MOIST	WET	
J6	1. 0 - 3	N/A	Weak to weak	Thin, Fine	Platy breaks, Granular	Moderate	Soft	Very friable	Slightly sticky, Slightly plastic	6.8
	2. 3 - 8	N/A	Weak	Fine	Subangular blocky	Moderate	Slightly hard	Friable	Slightly sticky, Slightly plastic	6.8
	3. 8 - 18	Very gravelly	Moderate	Fine, Medium	Subangular blocky	Moderate	Hard	Firm	Sticky, Plastic	7.0
	4. 18 - 25	Very gravelly	Weak	Fine, Medium	Subangular blocky	Slow	Hard	Firm	Sticky, Plastic	7.3
	5. 25 - 40	Very cobbly	Massive	-	-	Moderate	Slightly hard	Friable	Slightly sticky, Plastic	7.2
L1	1. 0 - 14	N/A	Weak	Very fine, Fine	Subangular blocky	Rapid	Soft	Very friable	Slightly sticky, Nonplastic	7.0
	2. 14 - 19	Gravelly	Weak	Very fine, Fine	Subangular blocky	Moderate	Slightly hard	Friable	Sticky, Plastic	6.5
	3. 19 - 56+	Gravelly	Strong	Fine, Medium	Subangular blocky	Slow	Hard	Firm	Sticky, Nonplastic	6.0
L2	1. 0 - 11	N/A	Weak	Very fine	Subangular blocky	Rapid	Soft	Very friable	Slightly sticky, Slightly plastic	6.3
	2. 11 - 20	N/A	Weak	Very fine	Subangular blocky	Rapid	Soft	Very friable	Slightly sticky, Slightly plastic	6.3
	3. 20 - 52	Gravelly	Moderate	Fine, Medium	Subangular blocky	Slow	Very hard	Very firm	Sticky, Plastic	7.0
	4. 52 - 73+	Gravelly	Moderate	Fine, Medium	Subangular blocky	Slow	Hard	Firm	Very sticky, Very plastic	7.0

TABLE OF SOIL CHARACTERISTICS OF MODAL SITE (CONTINUED)

LANDTYPE NO.	SOIL LAYER AND THICKNESS (INCHES)	ROCK FRAGMENT CLASS	STRUCTURE			PERMEABILITY	CONSISTENCY			pH
			GRADE	SIZE	TYPE		DRY	MOIST	WET	
L3	1. 0 - 12	N/A	Weak, Moderate	Very fine, Fine	Granular	Moderate	Soft	Very friable	Nonsticky, Slightly plastic	6.8
	2. 12 - 19	N/A	Strong	Fine	Subangular blocky	Slow	Hard	Firm	Very sticky, Very plastic	7.0
	3. 19 - 31	Gravelly	Strong	Fine	Subangular blocky	Slow	Hard	Firm	Very sticky, Very plastic	7.0
	4. 31 - 35+	Very gravelly	Strong	Fine	Subangular blocky	Slow	Very hard	Very firm	Sticky, Plastic	6.8
L5	1. 0 - 10	N/A	Stucture-less to weak	Very fine	Subangular blocky	Rapid	Soft	Very friable	Nonsticky, Nonplastic	6.0
	2. 10 - 24	N/A	Stucture-less	-	-	Rapid	Soft	Very friable	Nonsticky, Nonplastic	6.3
	3. 24 - 33	N/A	Stucture-less	-	-	Rapid	Soft	Very friable	Nonsticky, Nonplastic	7.5
	4. 33 - 36+	N/A	Massive	-	-	Slow	Hard	Friable	Slightly sticky, Slightly plastic	7.0
L6	1. 0 - 19	N/A	Stucture-less to weak	Very fine	Subangular blocky	Rapid	Soft	Very friable	Nonsticky, Nonplastic	6.3
	2. 19 - 36	Very gravelly	Strong	Very fine, Fine	Subangular blocky	Slow	Very hard	Very firm	Very sticky, Very plastic	6.8
	3. 36 - 73	N/A	Strong	Very fine	Subangular blocky	Very slow	Very hard	Very firm	Very sticky, Very plastic	7.0
	4. 73 - 122+	N/A	Moderate	Very fine	Subangular blocky	Slow	Hard	Firm	Sticky, Plastic	7.0

TABLE OF SOIL CHARACTERISTICS OF MODAL SITE (CONTINUED)

LANDTYPE NO.	SOIL LAYER AND THICKNESS (INCHES)	ROCK FRAGMENT CLASS	STRUCTURE			PERMEABILITY	CONSISTENCY			pH
			GRADE	SIZE	TYPE		DRY	MOIST	WET	
L7	1. 0 - 12	N/A	Strong	Fine, Medium	Granular	Moderate	Hard	Friable	Slightly sticky, Slightly plastic	8.0
	2. 12 - 31	N/A	Strong	Very coarse	Subangular blocky	Very slow	Very hard	Very firm	Sticky, Plastic	7.5
	3. 31 - 35	N/A	Massive	-	-	Very slow	Hard	Firm	Sticky, Plastic	7.5
	4. 35 - 38+	N/A	Massive	-	-	Very slow	Hard	Firm	Sticky, Plastic	7.3
L8	1. 0 - 1	N/A	Weak	Fine	Granular	Rapid	Loose	Very friable	Nonsticky, Nonplastic	6.0
	2. 1 - 19	N/A	Weak	Very fine	Subangular blocky	Rapid	Loose	Very friable	Nonsticky, Nonplastic	6.3
	3. 19 - 30	N/A	Weak to moderate	Very fine	Subangular blocky	Slow	Slightly hard	Friable	Sticky, Plastic	6.7
	4. 30 - 40+	N/A	Weak to moderate	Very fine	Subangular blocky	Slow	Slightly hard	Friable	Sticky, Plastic	6.7
M1	A miscellaneous landtype with no modal soil site identified.									
M2	A miscellaneous landtype with no modal soil site identified.									
M3	A miscellaneous landtype with no modal soil site identified.									
M8	A miscellaneous landtype with no modal soil site identified.									
N1	1. 0 - 9	N/A	Massive	-	-	Rapid	Soft	Very friable	Nonsticky, Nonplastic	6.0
	2. 9 - 26	Cobbly	Moderate	Very fine	Angular blocky	Moderate to slow	Hard	Firm	Sticky, Plastic	6.2
N2	1. 0 - 15	N/A	Massive	-	-	Rapid	Soft	Very friable	Nonsticky, Nonplastic	6.0
	2. 15 - 32	Cobbly	Moderate	Very fine	Angular blocky	Moderate to slow	Hard	Firm	Sticky, Plastic	5.8

TABLE OF SOIL CHARACTERISTICS OF MODAL SITE (CONTINUED)

LANDTYPE NO.	SOIL LAYER AND THICKNESS (INCHES)	ROCK FRAGMENT CLASS	STRUCTURE			PERMEABILITY	CONSISTENCY			pH
			GRADE	SIZE	TYPE		DRY	MOIST	WET	
N3	1. 0 - 8	Cobbly	Massive	-	-	Rapid	Soft	Firm	Nonsticky, Nonplastic	6.0
	2. 8 - 25	Gravelly	Moderate	Very fine	Angular blocky	Moderate to slow	Hard	Friable	Sticky, Plastic	5.8
N4	0 - 12	Gravelly	Weak	Fine	Granular	Moderate	Slightly hard	Friable	Sticky, Plastic	6.0
N5	1. 0 - 9	Gravelly	Weak	Fine	Granular	Moderate	Slightly hard	Friable	Slightly sticky, Slightly plastic	6.2
	2. 9 - 18	Cobbly	Moderate	Very fine	Angular blocky	Moderate to slow	Hard	Firm	Sticky, Plastic	6.0
N6	1. 0 - 8	Cobbly	Weak	Fine	Granular	Moderate	Slightly hard	Firm	Sticky, Slightly plastic	5.8
	2. 8 - 18	N/A	Moderate	Very fine	Angular blocky	Moderate to slow	Hard	Very friable	Sticky, Plastic	6.2
N7	0 - 11	Gravelly	Weak	Fine	Granular	Moderate	Slightly hard	Friable	Slightly sticky, Slightly plastic	6.2
N8	0 - 8	Cobbly	Weak	Fine	Granular	Moderate	Slightly hard	Friable	Slightly sticky, Slightly plastic	6.0
N9	0 - 8	Very gravelly	Weak	Fine	Granular	Moderate	Slightly hard	Friable	Slightly sticky, Slightly plastic	5.8
P1	1. 0 - 4	N/A	Weak	Medium, Coarse	Platy	Rapid	Loose	Very friable	Nonsticky, Nonplastic	6.0
	2. 4 - 17	N/A	Weak	Very fine	Subangular blocky	Rapid	Loose	Very friable	Nonsticky, Nonplastic	6.0
	3. 17 - 28	Cobbly	Weak to moderate	Very fine and fine	Subangular blocky	Moderate	Slightly hard	Friable	Sticky, Plastic	6.7
	4. 28 - 30	Cobbly	Moderate	Very fine	Subangular blocky	Slow	Hard	Firm	Sticky, Very plastic	7.0

TABLE OF SOIL CHARACTERISTICS OF MODAL SITE (CONTINUED)

LANDTYPE NO.	SOIL LAYER AND THICKNESS (INCHES)	ROCK FRAGMENT CLASS	STRUCTURE			PERMEABILITY	CONSISTENCY			pH
			GRADE	SIZE	TYPE		DRY	MOIST	WET	
P2	1. 0 - 23	N/A	Weak	Very fine	Subangular blocky	Moderately rapid	Loose	Very friable	Nonsticky, Nonplastic	6.3
	2. 23 - 33	N/A	Weak, Moderate	Very fine	Subangular blocky	Moderate	Loose	Very friable	Nonsticky, Nonplastic	7.0
	3. 33 - 37	Cobbly	Massive	-	-	Slow	Slightly hard	Firm	Slightly sticky, Plastic	7.0
P3	1. 0 - 14	N/A	Weak	Very fine	Subangular blocky	Moderate	Soft	Very friable	Slightly sticky, Slightly plastic	7.5
	2. 14 - 28	N/A	Weak	Very fine	Subangular blocky	Moderate	Soft	Friable	Slightly sticky, Slightly plastic	7.0
	3. 28 - 32	N/A	Massive	-	-	Slow	Slightly hard	Firm	Sticky, Plastic	7.0
P4	1. 0 - 7	N/A	Weak	Very fine	Subangular blocky	Moderate	Soft	Very friable	Slightly sticky, Slightly plastic	7.3
	2. 7 - 11	N/A	Moderate	Very fine to fine	Subangular blocky	Moderate	Slightly hard	Friable	Slightly sticky, Slightly plastic	7.3
	3. 11 - 16	Very gravelly	Massive	-	-	Slow	Hard	Firm	Sticky, Plastic	7.3
P5	1. 0 - 5	N/A	Weak	Very fine	Subangular blocky	Moderate	Slightly hard	Friable	Slightly sticky, Slightly plastic	7.0
	2. 5 - 7	Gravelly	Strong	Very fine	Subangular blocky	Slow	Very hard	Firm	Sticky, Plastic	7.3
P8	1. 0 - 2	N/A	Weak	Very fine	Granular	Moderate	Soft	Friable	Nonsticky, Nonplastic	6.3
	2. 2 - 10	N/A	Weak	Very fine	Subangular blocky	Moderate	Soft	Friable	Nonsticky, Nonplastic	6.5
	3. 10 - 18	Very gravelly	Moderate	Very fine	Subangular blocky	Moderate	Hard	Firm	Sticky, Plastic	7.3

TABLE OF SOIL CHARACTERISTICS OF MODAL SITE (CONTINUED)

LANDTYPE NO.	SOIL LAYER AND THICKNESS (INCHES)	ROCK FRAGMENT CLASS	STRUCTURE			PERMEABILITY	CONSISTENCY			pH
			GRADE	SIZE	TYPE		DRY	MOIST	WET	
P9	1. 0 - 4	N/A	Weak	Very fine	Subangular blocky	Rapid	Soft	Very friable	Nonsticky, Nonplastic	7.0
	2. 4 - 19	N/A	Structureless	-	-	Rapid	Soft	Very friable	Nonsticky, Nonplastic	6.7
	3. 19 - 30	Gravelly	Weak	Very fine	Subangular blocky	Moderate	Soft	Very friable	Nonsticky, Nonplastic	7.5
Q1	1. 0 - 8	Gravelly	Weak	Fine	Crumb	Moderate	Slightly hard	Friable	Slightly sticky, Slightly plastic	6.2
	2. 8 - 18	Gravelly	Moderate	Very fine	Subangular blocky	Moderate	Slightly hard	Friable	Sticky, Plastic	6.2
Q2	1. 0 - 8	Gravelly	Weak	Fine	Crumb	Moderate	Slightly hard	Very friable	Slightly sticky, Slightly plastic	6.0
	2. 8 - 24	Gravelly	Weak	Fine	Subangular blocky	Moderate	Slightly hard	Very friable	Slightly sticky, Slightly plastic	5.8
Q3	1. 0 - 12	Gravelly	Weak	Very fine	Subangular blocky	Moderate	Slightly hard	Friable	Slightly sticky, Slightly plastic	6.4
Q4	1. 0 - 10	Gravelly	Weak	Very fine	Subangular blocky	Moderate	Slightly hard	Friable	Slightly sticky, Slightly plastic	6.4
Q7	1. 0 - 6	Very gravelly	Weak	Very fine	Subangular blocky	Moderate	Slightly hard	Friable	Slightly sticky, Slightly plastic	6.3
Q8	1. 0 - 8	N/A	Massive	-	-	Rapid	-	-	-	-
	2. 8 - 24	Gravelly	Moderate	Very fine	Subangular blocky	Moderate	Soft	Very friable	Nonsticky, Nonplastic	6.2

TABLE OF SOIL CHARACTERISTICS OF MODAL SITE (CONTINUED)

LANDTYPE NO.	SOIL LAYER AND THICKNESS (INCHES)	ROCK FRAGMENT CLASS	STRUCTURE			PERMEABILITY	CONSISTENCY			pH
			GRADE	SIZE	TYPE		DRY	MOIST	WET	
Q9	1. 0 - 10	N/A	Massive	-	-	Rapid	Soft	Very friable	Nonsticky, Nonplastic	5.8
	2. 10 - 30	Gravelly	Weak	Fine	Subangular blocky	Moderate	Slightly hard	Very friable	Slightly sticky, Slightly plastic	5.8
R1	1. 0 - 18	N/A	Weak	Fine	Crumb	Rapid	Soft	Very friable	Nonsticky, Nonplastic	6.0
	2. 18 - 60	Gravelly	Weak	Fine	Subangular blocky	Moderate	Hard	Firm	Slightly sticky, Nonplastic	5.8
R2	1. 0 - 18	N/A	Weak	Fine	Crumb	Rapid	Soft	Very friable	Nonsticky, Nonplastic	6.0
	2. 18 - 60	Gravelly	Weak	Fine	Subangular blocky	Moderate	Hard	Firm	Slightly sticky, Nonplastic	5.8
R3	1. 0 - 2	N/A	Weak	Very fine	Subangular blocky	Rapid	Soft	Very friable	Nonsticky, Nonplastic	7.5
	2. 2 - 6	N/A	Structureless	-	-	Rapid	Soft	Very friable	Nonsticky, Nonplastic	6.5
	3. 6 - 15	N/A	Stucture-less	-	-	Rapid	Soft	Very friable	Nonsticky, Nonplastic	6.5
	4. 15 - 56+	Very gravelly	Weak	Fine	Subangular blocky	Moderate	Slightly hard	Friable	Slightly sticky, Slightly plastic	6.3
R4	1. 0 - 10	Very gravelly	Weak	Fine	Granular	Rapid	Soft	Friable	Nonsticky, Nonplastic	6.0
R5	1. 0 - 10	Very gravelly	Weak	Fine	Granular	Rapid	Soft	Friable	Nonsticky, Nonplastic	6.0
R6	1. 0 - 2	N/A	Weak	Very fine	Subangular blocky	Rapid	Soft	Very friable	Nonsticky, Nonplastic	7.5
	2. 2 - 6	N/A	Structureless	-	-	Rapid	Soft	Very friable	Nonsticky, Nonplastic	6.5
	3. 6 - 15	N/A	Structureless	-	-	Rapid	Soft	Very friable	Nonsticky, Nonplastic	6.5
	4. 15 - 56+	Very gravelly	Weak	Fine	Subangular blocky	Moderate	Slightly hard	Friable	Slightly sticky, Slightly plastic	6.3

TABLE OF SOIL CHARACTERISTICS OF MODAL SITE (CONTINUED)

LANDTYPE NO.	SOIL LAYER AND THICKNESS (INCHES)	ROCK FRAGMENT CLASS	STRUCTURE			PERMEABILITY	CONSISTENCY			pH
			GRADE	SIZE	TYPE		DRY	MOIST	WET	
R7	1. 0 - 20	N/A	Weak	Fine	Granular	Rapid	Soft	Very friable	Nonsticky, Nonplastic	5.9
	2. 20 - 40	N/A	Moderate	Fine	Subangular blocky	Slow	Hard	Firm	Sticky, Plastic	6.2
	3. 40 - 50	Gravelly	Moderate	Fine	Subangular blocky	Moderate	Hard	Firm	Slightly sticky, Slightly plastic	6.2
S1	A miscellaneous landtype with no modal soil site identified.									
T2	1. 0 - 18	N/A	Weak	Fine	Granular	Moderate	Soft	Very friable	Nonsticky, Nonplastic	6.2
	2. 18 - 36	N/A	Weak	Fine	Granular	Moderate	Soft	Very friable	Nonsticky, Nonplastic	6.0
	3. 36 - 60	N/A	Strong	Medium	Blocky	Very slow	Very hard	Very firm	Very sticky, Very plastic	6.0
	4. 60 - 100	Gravelly	Strong	Medium	Blocky	Very slow	Hard	Very firm	Very sticky, Very plastic	6.0
T3	1. 0 - 3	N/A	Moderate	Fine	Granular	Moderate	Soft	Very friable	Slightly sticky, Slightly plastic	7.0
	2. 3 - 16	N/A	Moderate	Fine to medium	Platy	Moderate	Slightly hard	Very friable	Slightly sticky, Slightly plastic	7.0
	3. 16 - 26	N/A	Moderate	Very fine to fine	Subangular blocky	Very slow	Very hard	Firm	Sticky, Very plastic	7.5
	4. 26 - 57	N/A	Weak	Very fine	Subangular blocky	Slow	Hard	Firm	Slightly sticky, Plastic	7.2
	5. 57 - 107	N/A	Weak	Very fine	Subangular blocky	Very slow	Hard	Firm	Slightly sticky, Plastic	7.8

TABLE OF SOIL CHARACTERISTICS OF MODAL SITE (CONTINUED)

LANDTYPE NO.	SOIL LAYER AND THICKNESS (INCHES)	ROCK FRAGMENT CLASS	STRUCTURE			PERMEABILITY	CONSISTENCY			pH
			GRADE	SIZE	TYPE		DRY	MOIST	WET	
T5	1. 0 - 7	N/A	Moderate, Weak	Fine	Platy	Moderate	Soft	Very friable	Slightly sticky, Slightly plastic	7.5
	2. 7 - 15	N/A	Moderate	Very fine, Fine	Subangular blocky	Very slow	Extremely hard	Extremely firm	Very sticky, Very plastic	7.0
	3. 15 - 26+	N/A	Moderate	Very fine	Subangular blocky	Very slow	Extremely hard	Extremely firm	Very sticky, Very plastic	8.0
T6	1. 0 - 30	N/A	Structureless	-	-	Rapid	Loose	Very friable	Nonsticky, Nonplastic	6.7
	2. 30 - 60	Gravelly	Moderate	Fine	Subangular blocky	Slow	Hard	Firm	Sticky, Plastic	7.5
T7	1. 0 - 6	N/A	Weak	Fine	Granular	Moderate	Soft	Very friable	Slightly sticky, Nonplastic	6.6
	2. 6 - 11	N/A	Moderate	Very fine, Fine, Medium	Subangular blocky	Slow	Hard	Firm	Slightly sticky, Plastic	6.6
	3. 11 - 32	N/A	Strong	Fine, Medium	Subangular blocky	Very slow	Very hard	Very firm	Sticky, Very plastic	7.6
	4. 32 - 40	N/A	Weak	Very fine	Subangular blocky	Very slow	Very hard	Very firm	Sticky, Very plastic	8.0
	5. 40 - 48	N/A	Strong	Very fine, Fine	Subangular blocky	Very slow	Extremely hard	Firm	Slightly sticky, Slightly plastic	8.0
T8	1. 0 - 1	N/A	Weak	Very fine, Fine	Granular	Rapid	Soft	Very friable	Nonsticky, Nonplastic	6.0
	2. 1 - 19	N/A	Structureless - weak	Very fine	Subangular blocky	Rapid	Soft	Very friable	Nonsticky, Nonplastic	6.3
	3. 19 - 30	N/A	Moderate	Very fine	Subangular blocky	Slow	Slightly hard	Friable	Sticky, Plastic	6.7
	4. 30 - 39	N/A	Moderate	Very fine	Subangular blocky	Slow	Slightly hard	Friable	Sticky, Plastic	6.7

TABLE OF SOIL CHARACTERISTICS OF MODAL SITE (CONTINUED)

LANDTYPE NO.	SOIL LAYER AND THICKNESS (INCHES)	ROCK FRAGMENT CLASS	STRUCTURE			PERMEABILITY	CONSISTENCY			pH
			GRADE	SIZE	TYPE		DRY	MOIST	WET	
U4	1. 0 - 8	N/A	Massive	-	-	Rapid	Soft	Very friable	Nonsticky, Nonplastic	6.3
	2. 8 - 36	Gravelly	Strong	Fine	Angular blocky	Very slow	Very hard	Very firm	Very sticky, Very plastic	6.0
U5	1. 0 - 12	N/A	Weak	Very fine	Crumb	Moderate	Slightly hard	Friable	Slightly sticky, Slightly plastic	6.1
	2. 12 - 30	N/A	Moderate	Very fine	Subangular blocky	Moderate	Slightly hard	Friable	Sticky, Plastic	6.8
V1	1. 0 - 17	N/A	Weak	Fine	Crumb	Moderate	Soft	Very friable	Sticky, Plastic	7.5
	2. 17 - 32	N/A	Moderate	Very fine	Subangular blocky	Slow	Hard	Firm	Very sticky, Very plastic	7.7
V2	1. 0 - 8	N/A	Massive	-	-	Rapid	Soft	Very friable	Nonsticky, Nonplastic	6.2
	2. 8 - 13	Gravelly	Weak	Very fine	Subangular blocky	Moderate	Slightly hard	Friable	Slightly sticky, Slightly plastic	6.8
V3	1. 0 - 9	Gravelly	Weak	Very fine	Crumb	Moderate	Slightly hard	Friable	Slightly sticky, Slightly plastic	6.4
	2. 9 - 18	Gravelly	Weak	Very fine	Subangular blocky	Moderate	Slightly hard	Friable	Slightly sticky, Slightly plastic	6.5
V4	1. 0 - 8	Very gravelly	Weak	Very fine	Granular	Moderate	Slightly hard	Friable	Nonsticky, Nonplastic	6.5
V5	1. 0 - 6	Very gravelly	Weak	Very fine	Granular	Rapid	Slightly hard	Friable	Nonsticky, Nonplastic	6.6

TABLE OF SOIL CHARACTERISTICS OF MODAL SITE (CONTINUED)

LANDTYPE NO.	SOIL LAYER AND THICKNESS (INCHES)	ROCK FRAGMENT CLASS	STRUCTURE			PERMEABILITY	CONSISTENCY			pH
			GRADE	SIZE	TYPE		DRY	MOIST	WET	
V6	1. 0 - 14	N/A	Massive	-	-	Rapid	Soft	Very friable	Nonsticky, Nonplastic	6.3
	2. 14 - 30	Gravelly	Weak	Very fine	Subangular blocky	Moderate	Slightly hard	Friable	Slightly sticky, Slightly plastic	6.6
V7	1. 0 - 8	Very gravelly	Weak	Very fine	Granular	Rapid	Slightly hard	Friable	Nonsticky, Nonplastic	6.7
V8	1. 0 - 3	N/A	Moderate	Fine	Crumb	Moderate	Soft	Friable	Slightly sticky, Nonplastic	7.2
	2. 3 - 8	N/A	Weak	Very fine	Subangular blocky	Moderate	Soft	Friable	Slightly sticky, Nonplastic	7.2
	3. 8 - 17	N/A	Weak	Very fine	Subangular blocky	Moderate	Soft	Friable	Slightly sticky, Nonplastic	7.2
	4. 17 - 19	N/A	Moderate	Very fine	Subangular blocky	Moderate	Slightly hard	Firm	Slightly sticky, Slightly plastic	7.0
X3	1. 0 - 22	N/A	Moderate	Fine, Medium	Subangular blocky	Moderate	Slightly hard	Friable	Slightly sticky, Slightly plastic	8.0
	2. 22 - 38	N/A	Strong	Medium, Coarse	Subangular blocky	Very slow	Extremely hard	Very firm	Very sticky, Very plastic	7.0
X6	1. 0 - 7	N/A	Weak	Very fine	Subangular blocky	Rapid	Soft	Friable	Nonsticky, Slightly plastic	7.0
	2. 7 - 31	Very cobbly	Weak	Very fine, Fine	Subangular blocky	Rapid	Soft	Friable	Nonsticky, Slightly plastic	7.0

TABLE OF SOIL CHARACTERISTICS OF MODAL SITE (CONTINUED)

LANDTYPE NO.	SOIL LAYER AND THICKNESS (INCHES)	ROCK FRAGMENT CLASS	STRUCTURE			PERMEABILITY	CONSISTENCY			pH
			GRADE	SIZE	TYPE		DRY	MOIST	WET	
X7	1. 0 - 6	N/A	Weak	Fine	Crumb	Moderate	Soft	Very friable	Slightly sticky, Nonplastic	6.7
	2. 6 - 17	N/A	Massive to weak	Very fine	Subangular blocky	Moderate	Soft	Very friable	Slightly sticky, Nonplastic	7.0
	3. 17 - 21	Very cobbly	Weak	Very fine	Subangular blocky	Slow	Slightly firm	Friable	Sticky, Slightly plastic	7.0
X8	1. 0 - 6	N/A	Strong	Very fine, Fine	Crumb	Moderate	Soft	Very friable	Slightly sticky, Plastic	7.0
	2. 6 - 14	N/A	Strong	Very fine, Fine	Subangular blocky	Moderate	Slightly hard	Very friable	Slightly sticky, Plastic	7.0
	3. 14 - 21	N/A	Strong	Fine, Medium	Blocky	Very slow	Extremely hard	Firm	Very sticky, Very plastic	8.0
X9	1. 0 - 3	N/A	Moderate	Fine	Platy	Slow	Hard	Firm	Sticky, Plastic	7.5
	2. 3 - 12	N/A	Strong	Very fine	Subangular blocky	Very slow	Hard	Firm	Very sticky, Very plastic	7.2
	3. 12 - 24	N/A	Massive			Very slow	Very hard	Very firm	Sticky, Very plastic	7.0
Y1	1. 0 - 5	N/A	Weak	Very fine to fine	Granular	Moderate	Soft	Very friable	Slightly sticky, Slightly plastic	6.8
	2. 5 - 18	N/A	Moderate	Very fine	Subangular blocky	Moderate	Soft	Very friable	Slightly sticky, Slightly plastic	7.0
	3. 18 - 24	Very cobbly	Moderate	Very fine	Subangular blocky	Moderate	Soft	Very friable	Slightly sticky, Slightly plastic	7.0

TABLE OF SOIL CHARACTERISTICS OF MODAL SITE (CONTINUED)

LANDTYPE NO.	SOIL LAYER AND THICKNESS (INCHES)	ROCK FRAGMENT CLASS	STRUCTURE			PERMEABILITY	CONSISTENCY			pH
			GRADE	SIZE	TYPE		DRY	MOIST	WET	
Y2	1. 0 - 4	N/A	Weak	Very fine to fine	Granular	Rapid	Loose	Very friable	Slightly sticky, Nonplastic	6.7
	2. 4 - 11	N/A	Weak	Very fine	Subangular blocky	Rapid	Loose	Very friable	Slightly sticky, Nonplastic	6.9
	3. 11 - 25	Very cobbly	Weak	Very fine	Subangular blocky	Rapid	Loose	Very friable	Slightly sticky, Nonplastic	6.9
	4. 25 - 52	Very cobbly	Moderate	Very fine	Subangular blocky	Moderate	Slightly hard	Friable	Sticky, Plastic	7.2
Y3	1. 0 - 4	N/A	Weak	Very fine, fine	Crumb	Moderate	Soft	Very friable	Slightly sticky, Nonplastic	6.8
	2. 4 - 13	N/A	Moderate	Very fine	Subangular blocky	Moderate	Soft	Very friable	Slightly sticky, Slightly plastic	7.0
	3. 13 - 25	Gravelly	Moderate	Very fine	Subangular blocky	Slow	Slightly hard	Firm	Sticky, Plastic	7.0
	4. 25 - 33	Extremely cobbly	Moderate	Very fine	Subangular blocky	Slow	Very hard	Very firm	Sticky, Plastic	7.0
Y4	1. 0 - 3	N/A	Weak	Very fine, Fine	Crumb	Slow	Soft	Friable	Sticky, Plastic	7.6
	2. 3 - 15	Gravelly	Strong	Very fine, Fine	Subangular blocky	Very slow	Very hard	Very firm	Sticky, Very plastic	7.6
Y7	1. 0 - 2	N/A	Weak	Fine to moderate	Platy	Moderate	Soft	Friable	Sticky, Plastic	6.0
	2. 2 - 26	N/A	Weak	Very fine to moderate	Subangular blocky	Slow	Slightly hard	Friable	Sticky, Plastic	6.5

TABLE OF SOIL CHARACTERISTICS OF MODAL SITE (CONTINUED)

LANDTYPE NO.	SOIL LAYER AND THICKNESS (INCHES)	ROCK FRAGMENT CLASS	STRUCTURE			PERMEABILITY	CONSISTENCY			pH
			GRADE	SIZE	TYPE		DRY	MOIST	WET	
Y8	1. 0 - 4	N/A	Weak	Fine	Granular	Rapid	Loose	Very friable	Nonsticky, Nonplastic	6.5
	2. 4 - 17	N/A	Weak	Very fine	Subangular blocky	Rapid	Loose	Very friable	Slightly sticky, Nonplastic	6.5
	3. 17 - 29	N/A	Structureless	-	-	Moderate	Loose	Very friable	Slightly sticky, Nonplastic	6.5
	4. 29 - 40	N/A	Structureless	-	-	Moderate	Loose	Very friable	Slightly sticky, Nonplastic	6.5
Y9	1. 0 - 4	N/A	Moderate	Fine to moderate	Granular	Moderate	Loose	Very friable	Slightly sticky, Slightly plastic	6.4
	2. 4 - 15	N/A	Weak	Very fine to fine	Subangular blocky	Moderate	Slightly hard	Friable	Sticky, Plastic	7.0
	3. 15 - 34	Cobbly	Weak	Very fine to fine	Subangular blocky	Moderate	Slightly hard	Friable	Sticky, Plastic	6.8

TABLE OF LANDTYPE CHARACTERISTICS, FEATURES, AND QUALITIES

Landform - Refers to the shape and configuration of a specific, identifiable part of the landscape common to the mapping unit.

Slope - Range of slope of landtype.

Aspect - Direction of slope exposure.

Elevation - Altitude above mean sea level expressed in feet.

Origin of Soil Material - Identifies what geologic materials the soil is derived from. (See glossary for definition of specific terms.)

Depth to Bedrock - Average range of depth to consolidated rock materials.

Infiltration Class - Rate of entry of water into soil surface. The rate is dependent upon the type of surface soil texture, rock fragment content, structure, porosity, bulk density, and organic matter content.

Slow - Water stands on surface for long periods. Soils are fine textured, poorly aggregated, and puddle easily.

Moderate - Water enters soil at commensurated rates of normal rainfall or water application. Water may pond for short periods (a few days) following very intensive rainfall. Soils are medium-textured and well aggregated.

Rapid - Water rarely ponds, enters soil surface very rapidly. Soils are coarse textured, porous, loose, and usually single-grained.

Drainage Class - 1/ The rapidity and extent of removal of water from the soil. Based on soil permeability, infiltration, internal drainage, and topographic position.

Poorly drained - Water table at or near the surface a considerable part of the time. Soils of this class usually occupy level or depressed sites and are frequently ponded. Water is removed so slowly that soil remains wet almost all the time.

Somewhat poorly drained - Water removed so slowly that the soil remains wet for significant periods but not all the time.

Moderately well drained - Soil remains wet for a period somewhat longer (up to one month) than the wet season; may be due in part to a slowly permeable layer, high water table, or lateral seepage.

Well drained - Water is removed from soil readily and these soils are saturated only during the wet season for short periods.

1/ Very poorly drained and somewhat excessively drained classes are not used.

Excessively drained - Water is removed from soil rapidly and these soils are rarely ever saturated. Commonly, these soils are coarse-textured or shallow, stony, and/or occur on steep slopes.

Major Drainage Pattern and Intensity - The dominant drainage pattern and number of drainage miles per square mile.

Intensity Classes

Few - 0 to 2 drainage miles per square mile.
Common - 3 to 6 drainage miles per square mile.
Abundant - Greater than 7 drainage miles per square mile.

Plant Community Types - 1/ This identifies the major plant community types associated with the landtype by a code number and in ( ) a former code for Blue Mountain mapping types. The code number is fully described in Pacific Northwest Ecoclass Identification, R-6 Regional Guide 1-1.

Overstory Species - Identifies the predominate tree species of the landtype. Doesn't refer to abundance.

Understory Species - Identifies the predominate shrubs of the landtype.

Ground Cover Species - Identifies the predominate grasses and forbs of the landtype.

Range of Mean Annual Production Potential - 1/ These figures are for the range of plant communities recognized for each landtype. Values are taken from the Productivity section of the plant community descriptions in the "Plant Communities of the Blue Mountains in Eastern Oregon and Southeastern Washington".

Timber Production

Cu. Ft./Ac. - These values are a range of mean cubic volume growth indexes per acre per year of wood growing potential.

Site Class by Species - These site classes are from R-6 Timber Inventory Procedures Handbook applied to site indexes given the plant community types. Class limits correspond to height (site index) of ponderosa pine and Douglas-fir at 100 years.

	Ponderosa Pine	Douglas-fir
Class 1	Greater than 185 S.I.	Greater than 120 S.I.
Class 2	185 S.I. to 155 S.I.	120 S.I. to 100 S.I.
Class 3	155 S.I. to 125 S.I.	100 S.I. to 85 S.I.
Class 4	125 S.I. to 95 S.I.	85 S.I. to 70 S.I.
Class 5	Less than 95 S.I.	70 S.I. to 55 S.I.

Herbage Production

Pounds/Acre - These values are a range of total pounds per acre per year of all grasses and forbs available from a good range condition.

1/ Reference: Hall, F.C., 1973, pp. 2.

Potential Fertilizer Response - This is a relative prediction of the expected response of the landtype to balanced fertilizer applications. Factors considered for the expected response are: Plant available moisture, plant community, aspect, and minerology of soil materials.

High - Factors indicate a good response to fertilizer.

Moderate - Factors indicate a moderate response to fertilizer.

Low - Factors indicate a low response to fertilizer.

TABLE OF LANDTYPE CHARACTERISTICS, FEATURES, AND QUALITIES

LANDTYPE NO.	LANDFORM	SLOPE %	GENERAL ASPECT	ELEVATION (FEET)	ORIGIN OF SOIL MATERIAL	RANGE OF DEPTH TO BEDROCK (INCHES)
A1	Low and intermediate stream terraces	0-15	All	3800 - 5500	Alluvium	20-60+
A2	Upper stream terraces, alluvial fans	0-20	All	3800 - 5500	Alluvium	40 to 60+
A4	Stream terraces and alluvial fans	0-15	All	3200 - 6500	Alluvium	20 to 60+
B1	Highly dissected, moderately steep to very steep upland sideslopes	30-100	All	3500 - 6500	Loess mixed with residuum and colluvium	5-17
B4	Smooth to moderately dissected, steep to very steep upland sideslopes	30-70	All	3500 - 6500	Loess mixed with residuum and colluvium	5-17
B5	Smooth, gentle to moderately steep upland flats and benches	2-30	All	3500 - 6500	Loess mixed with residuum and colluvium	5 - 17
B6	Smooth, gentle to moderately steep upland flats and benches	2-20	All	5000 - 6500	Ash mixed with loess overlying residuum	18 - 40
B7	Smooth to moderately dissected, steep to very steep upland sideslopes	30-70	Southerly	3500 - 6200	Ash mixed with loess overlying colluvium	20 - 60
B8	Smooth steep to very steep upland sideslopes	30-70	Southerly	5000 - 6500	Ash mixed with loess and colluvium	20 - 60
B9	Smooth steep to very steep upland sideslopes	30-70	Northerly	4000 - 6500	Ash overlying or mixed with colluvium	20 - 60
C1	Moderately steep to very steep sided of deep canyon sideslopes of lava plains	15-100 with rock ledges	All	2000 - 3000	Ash and loess mixed with colluvium of sedimentary and volcanic origin	Exposed rock to over 144

TABLE OF LANDTYPE CHARACTERISTICS, FEATURES, AND QUALITIES

LANDTYPE NO.	LANDFORM	SLOPE %	GENERAL ASPECT	ELEVATION (FEET)	ORIGIN OF SOIL MATERIAL	RANGE OF DEPTH TO BEDROCK (INCHES)
C2	Moderately steep to very steep scarp slopes lying above major landslide areas	15-100 with rock ledges	Northerly	5000 - 7000	Ash, loess, residuum mixed with colluvium of sedimentary and volcanic origin	Exposed rock to over 144
C3	Moderately steep to very steep scarp slopes lying above major landslide areas	15-100 with rock ledges	Southerly	5000 - 6500	Ash, loess, residuum mixed with colluvium of sedimentary and volcanic origin	Exposed rock to over 144
C5	Deep drainage sideslopes of mountain uplands	15-100 with rock ledges	Northerly	4500-6800	Ash mixed with loess and colluvium of sedimentary and volcanic origin	Variable
C6	Deep drainage sideslopes of mountain uplands	15-100	Southerly	3600 - 6800	Loess mixed with colluvium of sedimentary and volcanic origin	Exposed rock to 20
C7	Deep drainage sideslopes of mountain uplands	15-100	Southerly	3200 - 6000	Loess mixed with colluvium of sedimentary and volcanic origin	Variable
C8	Deep drainage sideslopes of mountain uplands	15-100	All	3200 - 6800	Ash mixed with loess and colluvium of sedimentary and volcanic origin	Variable
C9	Scarp slopes of lava flows in subalpine positions	15-100 with rock ledges	Northerly	6000 - 7000	Ash mixed with loess and colluvium of volcanic origin	Exposed rock to over 144
D1	Nearly level to gentle sloping upland terraces and sideslopes	2-15	All	2400 - 3000	Mixed alluvium with pumice and ash in upper parts	20 - 40
E1	Nearly level to gentle sloping and hilly upland sideslopes and terraces	2-15	All	2100 - 3300	Alluvium mixed with colluvium	25 - 40 20 - 30 (duripan)
E2	Moderately steep to steep of basalt flow escarpments and general upland sideslopes	15-40	Northerly	2100 - 3300	Eolian deposits with a high content of ash and pumice	40 - 60

TABLE OF LANDTYPE CHARACTERISTICS, FEATURES, AND QUALITIES

LANDTYPE NO.	LANDFORM	SLOPE %	GENERAL ASPECT	ELEVATION (FEET)	ORIGIN OF SOIL MATERIAL	RANGE OF DEPTH TO BEDROCK (INCHES)
E3	Gentle slopes of basalt flow escarpments and general upland sideslopes.	2-15	All	2100 - 3300	Eolian deposits with a high content of ash and pumice.	40-60
E4	Nearly level to moderately steep upland terraces and sideslopes	2-20	All	2200 - 3500	Moderately fine to fine textured colluvium of sedimentary origin	20-30 (duripan)
E5	Gentle to steep upland sideslopes	2-40	All	3500 - 4500	Mixed clayey colluvium from consolidated sediments, tuffs, rhyolites, and basalts. Overlying partially consolidated sediments	20-40 20-30 (duripan)
E6	Gently sloping old terraces and upland sideslopes	2-15	All	2100 - 3500	Medium textured alluvium or colluvium from basalts	20-40
E7	Moderately steep to steep hilly upland sideslopes	15-40	Southerly	2100 - 3500	Loess and mixed colluvium	25-40
E8	Undulating to rolling upland plains	2-20	All	3200 - 3500	Mixed aeolian and sedimentary materials	10-20
F1	Gentle sloping, nearly level to concaved shaped bottomland alluvial terraces and fans	2-15	All	2100 - 3500	Alluvium that is high in ash and pumice.	40-60+
F2	Gentle sloping, nearly level to concaved shaped alluvial fans	1-8	All	3000 - 3500	Alluvium that is high in ash and pumice	More than 60
G1	Gentle to moderately steep upland slopes	8-40	Northerly	2500 - 3500	Loess mixed with colluvium of fine textured sediments	20-60+
G2	Gentle to moderately steep upland slopes	10-30	Southerly	2500 - 3500	Loess mixed with colluvium of fine calcareous sediments	20-60+
G3	Steep to very steep upland slopes	30-70	Southerly	2500 - 3500	Loess mixed with colluvium of fine calcereous sediments	20-60+
G7	Steep to very steep upland slopes	30-70	Northerly	3000 - 5100	Loess over mixed colluvium of sedimentary and basaltic origins	30 to over 60
H2	Gentle to moderately steep upland sideslopes	2-30	Southerly	3000 - 4500	Colluvium consisting of loess mixed with rock fragments and fines weathered from underlying old basalts	15-20

TABLE OF LANDTYPE CHARACTERISTICS, FEATURES, AND QUALITIES

LANDTYPE NO.	LANDFORM	SLOPE %	GENERAL ASPECT	ELEVATION (FEET)	ORIGIN OF SOIL MATERIAL	RANGE OF DEPTH TO BEDROCK (INCHES)
H3	Steep to very steep upland sideslopes	30-70	Southerly	3000 - 4500	Colluvium consisting of loess mixed with rock fragments and fines weathered from underlying old basalts	15-20
J0	Nearly level to gentle sloping basalt flow slopes	2-15	All	2800 - 3200	Mixtures of loess, old alluvium, and residium weathered from basalt	0 - 4
J1	Nearly level to moderately steep upland sideslopes	2-20	All	2500 - 3600	Mixture of loess, old alluvium, and residium weathered from basalt	4 - 12
J2	Upland escarpment slopes	30-70	All	2100 - 4500	Mixture of loess and colluvium of underlying rock types	Variable
J3	Gentle to moderately steep upland sideslopes	2-20	All	3300 - 3900	Fine textured sediments mixed with rhyolite and basalt colluvium	20-40 (duripan)
J5	Steep to very steep upland and mountain sideslopes	30-70	South	3500 - 5100	Colluvium consisting of fine sediments and basalt fragments	20-60+
J6	Steep to very steep upland and mountain sideslopes	30-70	South	3000 - 4500	Colluvium	20-40
L1	Narrow hummock slopes within large deep seated landslide debris	20-50	All	4500 - 5500	Ash over or ash mixed with landslide debris	40 to over 144
L2	Concaved shaped, moderately steep to steep northerly facing slopes of large deep seated landslide debris	2-50	Northerly	4500 - 6000	Ash over fine textured landslide debris	40 to over 144
L3	Concaved shaped, moderately steep to steep southerly facing slopes of large deep seated landslide debris	2-50	Southerly	4500 - 6000	Mixed ash and loess overlying landslide debris	40 to over 144
L5	Broad flats and depressional areas within landslide units	2-30	All	4500 - 6000	Ash overyling fine textured landslide debris	40 to over 144
L6	Concave shaped, moderately steep to steep northerly facing slopes of large deep seated landslide debris	2-50	Northerly	4500 - 6000	Ash overlying fine textured landslide debris	50 to over 144
L7	Gentle sloping flats within large deep seated landslide debris	2-20	All	4500 - 5500	Mixed ash and loess overlying fine textured landslide debris	40 to over 144

TABLE OF LANDTYPE CHARACTERISTICS, FEATURES, AND QUALITIES

LANDTYPE NO.	LANDFORM	SLOPE %	GENERAL ASPECT	ELEVATION (FEET)	ORIGIN OF SOIL MATERIAL	RANGE OF DEPTH TO BEDROCK (INCHES)
L8	Concaved shaped, moderately steep to steep southerly facing slopes of large deep seated landslide debris	2-50	Southerly	5500 - 6000	Ash overlying fine textured landslide debris	40 to over 144
M1	The lower positions of alluvial terraces and fans in gentle sloping depressional areas on generally flat to gently rolling lava flows in uplands	0-10	All	4500 - 6000	Alluvium	20 - 60
M2	Wet, moist, and dry meadow sites occurring as benches on upland sideslopes in highly weathered sedimentary rock	2-30	All	4500 - 6000	Mixed ash and loess overlying residuum, colluvium, or fine textured landslide debris	40 to over 144
M3	The upper positions of alluvial fans and terraces in gentle sloping depressional areas on generally flat to gently rolling lava flows in uplands	0-10	All	4500 - 6000	Alluvium	20 - 60
M8	Alluvial terraces and fans in gentle sloping depressional areas on rhyolitic flow in uplands	0-10	All	5000 - 6000	Alluvium	20 - 60
N1	Steep sideslopes	30-70	All	3600 - 6500	Ash overlying colluvium	18 - 48
N2	Steep sideslopes	30-70	Northerly	4000 - 6500	Ash overlying colluvium	18 - 48
N3	Upland flats and sideslopes	Less than 30%	All	3600 - 6500	Ash overlying residuum	12 - 36
N4	Steep sideslopes	30-70	All	3600 - 6500	Colluvium	8 - 15
N5	Steep sideslopes	30-70	Southerly	3600 - 6000	Residuum and colluvium	12 - 30
N6	Upland flats and sideslopes	Less than 30%	Southerly	3600 - 6000	Residuum	12 - 30

TABLE OF LANDTYPE CHARACTERISTICS, FEATURES, AND QUALITIES

LANDTYPE NO.	LANDFORM	SLOPE %	GENERAL ASPECT	ELEVATION (FEET)	ORIGIN OF SOIL MATERIAL	RANGE OF DEPTH TO BEDROCK (INCHES)
N7	Upland flats and sideslopes	Less than 30%	Southerly	3600 - 6000	Residuum	8 - 15
N8	Upland flats and sideslopes	Less than 30%	Southerly	3600 - 6000	Residuum	4 - 12
N9	Steep sideslopes	30-70	Southerly	3600 - 5600	Colluvium	4 - 12
P1	Mountain plateau lava flow flats and depressional slopes	Less than 20%	All	4500 - 6000	Ash overlying loess and residuum	20 - 60
P2	Mountain plateau lava flow scarps	2-40	Northerly	4500 - 6000	Ash overlying loess and residuum	20 - 60
P3	Mountain plateau lava flow flats	2-15	All	4300 - 5500	Ash, loess, and residuum	18 - 40
P4	Mountain plateau lava flow flats	2-15	All	4300 - 5500	Loess overlying residuum	12 - 18
P5	Mountain plateau lava flow flats	2-15	All	4300 - 7000	Loess and residuum	5 - 15
P8	Convex portion of upper slopes of mountain plateau drainages	15-30	All	4300 - 5500	Ash mixed with loess and residuum	18 - 40
P9	Mountain plateau lava flow flats	2-15	All	5500 - 7000	Ash overlying loess	18 - 40
Q1	Upland flats	Less than 30%	Southerly	4500 - 6000	Residuum	12 - 24
Q2	Upland flats and sideslopes	Less than 50%	Southerly	4500 - 6000	Residuum and colluvium	18 - 36
Q3	Upland flats	Less than 30%	Southerly	4500 - 6000	Residuum	10 - 15

TABLE OF LANDTYPE CHARACTERISTICS, FEATURES, AND QUALITIES

LANDTYPE NO.	LANDFORM	SLOPE %	GENERAL ASPECT	ELEVATION (FEET)	ORIGIN OF SOIL MATERIAL	RANGE OF DEPTH TO BEDROCK (INCHES)
Q4	Steep exposed sideslopes	30-70	All	4500 - 6000	Colluvium	6 - 15
Q7	Upland flats	Less than 30%	All	4500 - 6000	Residuum	4 - 8
Q8	Upland flats	Less than 30%	All	4500 - 6000	Ash overlying residuum	15 - 30
Q9	Upland flats and sideslopes	Less than 50%	All	4500 - 6500	Ash overlying residuum and colluvium	24 - 48
R1	Slightly concave shaped mountain slopes	30-70	Southerly	5000 - 6000	Ash overlying colluvium	40 - 80
R2	Gentle sloping, broad ridge tops	2-30	Southerly	5000 - 6000	Ash overlying residuum and colluvium	40 - 80
R3	Concave to straight mountain side-slopes	30-70	Northerly	5000 - 6000	Ash overlying colluvium	40 - 80
R4	Steep ridge and mountain slopes	30-70	All	5000 - 6000	Residuum and colluvium	6 - 14
R5	Upland flats and mountain sideslopes	2-30	All	5000 - 6000	Residuum and colluvium	6 - 14
R6	Concave mountain sideslopes	2-30	Northerly	5000 - 6000	Ash overlying colluvium and residuum	40 - 100
R7	Broad, gentle sloping ridge top flats	2-30	All	5000 - 6000	Ash overlying residuum	20 - 60
S1	Barren lava flow surfaces	2-15	All	4300 - 7000	Residuum	Exposed rock to 4
T2	Concaved shaped sideslopes and toe-slopes of mountain uplands	2-50	Northerly	4000 - 6500	Ash overlying residuum and colluvium	26 - 144

TABLE OF LANDTYPE CHARACTERISTICS, FEATURES, AND QUALITIES

LANDTYPE NO.	LANDFORM	SLOPE %	GENERAL ASPECT	ELEVATION (FEET)	ORIGIN OF SOIL MATERIAL	RANGE OF DEPTH TO BEDROCK (INCHES)
T3	Concaved shaped sideslopes and toeslopes of mountain uplands	2-50	Southerly	3400 - 6500	Mixed ash and loess overlying residuum and colluvium	26 - 144
T5	Dissected foothill and upland toeslopes	2-30	All	3400 - 5500	Loess overlying residuum	20 - 144
T6	Concaved shaped sideslopes and toeslopes of mountain uplands	2-50	Northerly	4000 - 6500	Ash overlying residuum and colluvium	35 - 144
T7	Gentle sloping upland benches and saddles	2-20	All	4000 - 6000	Loess overlying residuum	26 - 144
T8	Concaved shaped sideslopes and toeslopes of mountain uplands	2-50	Southerly	5000 - 6500	Ash overlying residuum	26 - 144
U4	Upland flats, sideslopes, and toeslopes	Less than 30%	All	3500 - 6200	Ash overlying residuum	24 - 72
U5	Upland sideslopes	Less than 30%	All	4000 - 5000	Residuum	15 - 48
V1	Moderately dissected, gentle to moderately steep foothill sideslopes	2-30	All	4500 - 5500	Colluvium	20 - 50
V2	Steep upland sideslopes	30-70	All	4000 - 6000	Ash overlying colluvium	18 - 30
V3	Steep sideslopes	30-70	Southerly	4000 - 6000	Colluvium	12 - 24
V4	Exposed ridges and sideslopes	10-70	All	4000 - 6000	Residuum and colluvium	6 - 12
V5	Steep sideslopes	30-70	Southerly	4000 - 6000	Colluvium	4 - 8
V6	Steep sideslopes	30-70	Northerly	4000 - 6000	Ash overlying colluvium	24 - 36

TABLE OF LANDTYPE CHARACTERISTICS, FEATURES, AND QUALITIES

LANDTYPE NO.	LANDFORM	SLOPE %	GENERAL ASPECT	ELEVATION (FEET)	ORIGIN OF SOIL MATERIAL	RANGE OF DEPTH TO BEDROCK (INCHES)
V7	Exposed ridgetops and toeslopes	Less than 30%	All	4000 - 6000	Residuum	6 - 12
V8	Straight to slightly benchy upland sideslopes	2-30	All	4500 - 5500	Ash mixed with residuum	14 - 30
X3	Plateau scarpslopes	20-50	All	4300 - 5500	Fine textured colluvium	30 - 60
X6	Mountainous basalt flow surface	2-15	All	5400 - 6000	Ash overlying loess and residuum	30 - 50
X7	Mountainous basalt flow surface	2-15	All	4300 - 5500	Ash mixed with loess overlying residuum	18 - 30
X8	Mountainous lava flow surfaces	2-15	All	4300 - 5500	Loess overlying residuum	14 - 24
X9	Gentle depressional positions of mountainous lava flows	2-15	All	4300 - 5500	Loess overlying residuum	20 - 40
Y1	High elevation upland flats and gentle sideslopes	2-30	All	6000 - 7000	Mixtures of ash, loess, and residuum	15 - 50
Y2	Steep sideslopes of upland drainages and lava flow scarps	30-70	Northerly	5000 - 6000	Ash overlying or mixed with colluvium	20 - 80
Y3	Steep sideslopes of upland drainages and lava flow scarps	30-70	Southerly	4300 - 6000	Loess mixed with colluvium	18 - 40
Y4	Steep sideslopes of upland drainages and lava flow scarps	30-70	All	4500 - 6000	Loess mixed with colluvium	12 - 40

TABLE OF LANDTYPE CHARACTERISTICS, FEATURES, AND QUALITIES

LANDTYPE NO.	LANDFORM	SLOPE %	GENERAL ASPECT	ELEVATION (FEET)	ORIGIN OF SOIL MATERIAL	RANGE OF DEPTH TO BEDROCK (INCHES)
Y7	Gentle slopes of upland flats	2-25	All	5500 - 6500	Loess and residuum	17 - 40
Y8	Gentle to moderately steep slopes of upland flats and lava flow scarps	2-30	All	6000 - 6500	Ash overlying loess and residuum	30 - 50
Y9	Sideslopes upland drainages and lava flow scarps	20-50	Southerly	5500 - 6500	Loess mixed with colluvium	18 - 40

TABLE OF LANDTYPE CHARACTERISTICS, FEATURES, AND QUALITIES (CONTINUED)

LANDTYPE NO.	INFILTRATION CLASS	DRAINAGE CLASS	MAJOR DRAINAGE PATTERN AND INTENSITY	PLANT COMMUNITY TYPES [1]	OVERSTORY SPECIES	UNDERSTORY SPECIES	GROUND COVER SPECIES
A1	Variable	Poorly to somewhat poorly	Dendritic, Few	2W (MW) 2M (MM)	Aspen	None	Wet Site: Nebraska sedge, ovalhead sedge, bentgrass Moist Site: Tufted hairgrass, Kentucky bluegrass, bentgrass, ovalhead sedge
A2	Variable	Moderately well to well	Dendritic, Few	2D (MD) SD-29-11 (4T)	Dry Meadow: None Meadow Fringe: Ponderosa pine	Dry Meadow: None Meadow Fringe: Big sagebrush	Tufted hairgrass, Kentucky bluegrass, California oatgrass, wheatgrass, fescue, Sandberg bluegrass
A4	Variable	Poorly to moderately well	Dendritic, Few	2W (MW) 2M (MM) 2D (MD)	None	None	Nebraska sedge, ovalhead sedge, Kentucky bluegrass, tufted hairgrass
B1	Slow	Well	Parallel, Abundant	CB-49-13 (1ss) SD-91-11 (4R) CJ-S1-11 (9A)	Juniper, scattered wolf pine	Curlleaf mahogany, low sagebrush, bitterbrush, stiff sagebrush, big sagebrush	Wheatgrass, Sandberg bluegrass, fescue, yarrow
B4	Slow	Well	Parallel, Few to Common	CB-49-13 (1ss) SD-91-11 (4R) CJ-S1-11 (9A)	Juniper, scattered wolf pine	Curlleaf mahogany, low sagebrush, still sagebrush, big sagebrush	Wheatgrass, Sandberg bluegrass, fescue, yarrow
B5	Slow	Well	Dendritic, Few to common	CB-49-13 (1fs) CJ-G1-11 (9B) GB-91-11 (1S) SD-91-11 (4R) CJ-S1-11 (9A)	Juniper, scattered wolf pine	Mahogany, low sagebrush, bitterbrush, stiff sagebrush, big sagebrush	Wheatgrass, Sandberg bluegrass, fescue, yarrow
B6	Moderate	Moderately well to well	Dendritic, Few	CD-G1-11 CW-G1-11 CW-G1-12	Ponderosa pine, Douglas-fir	Bitterbrush, mahogany, snowberry, spirea	Elksedge, pinegrass, heartleaf arnica, fescue

TABLE OF LANDTYPE CHARACTERISTICS, FEATURES, AND QUALITIES (CONTINUED)

LANDTYPE NO.	INFILTRATION CLASS	DRAINAGE CLASS	MAJOR DRAINAGE PATTERN AND INTENSITY	PLANT COMMUNITY TYPES	OVERSTORY SPECIES	UNDERSTORY SPECIES	GROUND COVER SPECIES
B7	Moderate	Well	Parallel, Few to common	CD-G1-11 (6S) CP-G1-12 (6F) CW-G1-11 (6CR)	Ponderosa pine, Douglas-fir	Mahogany, bitterbrush, snowberry	Elksedge, fescue, pinegrass, heartleaf arnica
B8	Rapid	Well	Parallel, Few	CW-G1-11 (6CR) CW-G1-12 (6CA)	Ponderosa pine, Douglas-fir, white fir, larch	Snowberry, spirea	Elksedge, pinegrass, heartleaf arnica
B9	Rapid	Well	Parallel, Few	CW-F3-11 (7WF) CW-G1-12 (6CA) CW-G1-11 (6CR)	Ponderosa pine, Douglas-fir, white fir, larch	Spirea, snowberry	Columbia brome, twinflower, pinegrass, elksedge, heartleaf arnica
C1	Variable	Well	Parallel, Few to common	SD-21-23 SD-21-21	Juniper	Big sagebrush, bitterbrush	Bluebunch wheatgrass, Idaho fescue
C2	Variable	Well	Parallel, Few to common	CW-F3-11 (7WF) CW-G1-12 (6CA) CW-G1-11 (6CR)	White fir, Douglas-fir, western larch, lodgepole, ponderosa	Spirea, snowberry	Pinegrass, Columbia brome, heartleaf arnica, elksedge, twinflower
C3	Variable	Well	Parallel, Few to common	CW-G1-11 (6CR) CD-G1-11 (6S)	Ponderosa pine, Douglas-fir	Bitterbrush, mahogany, snowberry	Elksedge, pinegrass
C5	Variable	Variable	Variable	CW-F3-11 (7WF)	White fir, Douglas-fir, western larch	Big huckleberry, grouse huckleberry	Pinegrass, Columbia brome, various forbs
C6	Variable	Variable	Variable	GB-49-13 lss SD-29-11 (4T) CP-G1-11 (6A) CJ-2S-11 (9B)	Juniper, ponderosa pine	Big sagebrush, low sagebrush, mountain mahogany	Idaho fescue, wheatgrass, Sandberg bluegrass
C7	Variable	Variable	Variable	CP-G1-12 (6F) CD-G1-11 (6S)	Ponderosa pine	Bitterbrush, mountain mahogany	Idaho fescue, wheatgrass, Sandberg bluegrass, elk sedge

TABLE OF LANDTYPE CHARACTERISTICS, FEATURES, AND QUALITIES (CONTINUED)

LANDTYPE NO.	INFILTRATION CLASS	DRAINAGE CLASS	MAJOR DRAINAGE PATTERN AND INTENSITY	PLANT COMMUNITY TYPES	OVERSTORY SPECIES	UNDERSTORY SPECIES	GROUND COVER SPECIES
C8	Variable	Variable	Variable	CW-G1-11 (6CR) CW-G1-12 (6CA)	Ponderosa pine, white fir, Douglas-fir	Spirea, snowberry	Pinegrass, elksedge, heartleaf arnica
C9	Variable	Variable	Variable	CA-G1-11 (7AS) CW-F3-11 (7WF)	White fir, subalpine fir, Douglas-fir, lodgepole	Grouse huckleberry	Columbia brome, twinflower, heartleaf arnica
D1	Rapid	Well drained	Dendritic, Few	SD-41-21 -	Juniper	Big sagebrush, bitterbrush, rabbitbrush, current	Wheatgrass, Sandberg bluegrass, Thurber needlegrass
E1	Moderate	Well drained	Dendritic, Few	GB-41-21 - SD-21-21 - SD-21-24 -	Juniper	Big sagebrush, gray rabbitbrush	Wheatgrass, Sandberg bluegrass, Thurber needlegrass
E2	Moderate	Excessively drained	Parallel, Few	SD-21-23 - SD-21-21 -	Juniper	Antelope bitterbrush, green rabbitbrush, big sagebrush	Fescue, bluebunch wheatgrass, big bluegrass, Sandberg bluegrass
E3	Moderate	Excessively drained	Parallel, Few	SD-21-23 - SD-21-21 -	Juniper	Antelope bitterbrush, green rabbitbrush, big sagebrush	Fescue, bluebunch wheatgrass, big bluegrass, Sandberg bluegrass
E4	Moderate	Well drained	Dendritic, Few	SD-21-21 - GB-41-22 - GB-41-21 -	Juniper	Bitterbrush, big sagebrush, rabbitbrush, wax currant	Wheatgrass, Sandberg bluegrass, Thurber needlegrass, various forbs
E5	Moderate to slow	Well drained	Dendritic, Few to common	GB-59 (north slopes) GB-41-21 (south slopes)	Juniper	Green rabbitbrush, wax currant, bitterbrush, service berry	Fescue, bluebunch wheatgrass, Sandberg bluegrass
E6	Moderate	Well drained	Dendritic, Few	GB-41-21 - SD-21-21 - SD-21-24 -	Juniper	Big sagebrush, rabbitbrush	Wheatgrass, Sandberg bluegrass, Thurber needlegrass

TABLE OF LANDTYPE CHARACTERISTICS, FEATURES, AND QUALITIES (CONTINUED)

LANDTYPE NO.	INFILTRATION CLASS	DRAINAGE CLASS	MAJOR DRAINAGE PATTERN AND INTENSITY	PLANT COMMUNITY TYPES	OVERSTORY SPECIES	UNDERSTORY SPECIES	GROUND COVER SPECIES
E7	Moderate	Well drained	Dendritic to parallel, Common	GB-41-21 - SD-21-21 - SD-21-24 -	Juniper	Big sagebrush, rabbitbrush	Wheatgrass, Sandberg bluegrass, Thurber needlegrass
E8	Moderate	Well drained	Dendritic, Few	SD-21-21 - GB-41-22 - GB-41-21 -	Juniper	Bitterbrush, big sagebrush, rabbitbrush, wax currant	Wheatgrass, fescue, Sandberg bluegrass
F1	Rapid	Well drained	Dendritic, Few	GB-41 - GB-29 - GB-79 - SD-21-21 - SD-21-23 -	Juniper	Big sagebrush, bitterbrush, rabbitbrush	Wheatgrass, Indian ricegrass, Sandberg bluegrass
F2	Rapid	Well drained	Dendritic, Few	GB-41 - GB-29 - GB-79 - SD-21-21 - SD-21-23 -	Juniper	Big sagebrush, bitterbrush, rabbitbrush	Wheatgrass, Indian ricegrass, Sandberg bluegrass
G1	Slow	Well drained	Dendritic, Few to Common	GB-41-22 - GB-41-21 -	Juniper	Bitterbrush, big sagebrush	Fescue, wheatgrass, Sandberg bluegrass
G2	Slow	Well drained	Dendritic, Few to Common	GB-41-21 -	Juniper	Bitterbrush, big sagebrush	Wheatgrass, Sandberg bluegrass
G3	Slow	Well drained	Dendritic to Parallel, Common	GB-41-21 -	Juniper	Rabbitbrush, big sagebrush, bitterbrush, shadscale	Bluebunch wheatgrass, Sandberg bluegrass, Thurber needlegrass
G7	Moderate	Well drained	Parallel, Common	GB-59 - GB-41-22 - GB-41-21 -	Juniper	Bitterbrush, big sagebrush	Idaho fescue, bluebunch wheatgrass, Sandberg bluegrass
H2	Moderate	Well drained	Dendritic to Parallel, Few	GB-49-13 - GB-41-21 -	Juniper	Big sagebrush, bitterbrush, rabbitbrush	Wheatgrass, Sandberg bluegrass, Thurber needlegrass

TABLE OF LANDTYPE CHARACTERISTICS, FEATURES, AND QUALITIES (CONTINUED)

LANDTYPE NO.	INFILTRATION CLASS	DRAINAGE CLASS	MAJOR DRAINAGE PATTERN AND INTENSITY	PLANT COMMUNITY TYPES	OVERSTORY SPECIES	UNDERSTORY SPECIES	GROUND COVER SPECIES
H3	Moderate	Well drained	Parallel, Few to Common	GB-49-13 - GB-41-21 -	Juniper	Big sagebrush, bitterbrush, rabbitbrush	Wheatgrass, Sandberg bluegrass, Thurber needlegrass
J0	Slow	Well drained	Dendritic, Few	GB-91-11 -	Juniper	Rigid sagebrush	Wheatgrass, Sandberg bluegrass
J1	Moderate	Well drained	Dendritic, Few	SD-91-11 -	Juniper	Ridig sagebrush	Sandberg bluegrass, squirreltail, buckwheat
J2	Variable	Well drained	Parallel, Common	Not rated	Juniper	Big sagebrush, bitterbrush, rabbitbrush	Bunchgrass
J3	Slow	Well drained	Dendritic, Few	GB-41-22 - GB-41-21 - SD-21-21 -	Juniper	Big sagebrush, bitterbrush	Wheatgrass, fescue, Sandberg bluegrass, Thurber needlegrass
J5	Moderate	Well drained	Parallel, Few	GB-41-21 -	Juniper	Rabbitbrush	Wheatgrass, Sandberg bluegrass, fescue
J6	Moderate	Well drained	Parallel to Dendritic, Common	GB-29 - GB-41 -	Juniper	Big sagebrush, bitterbrush	Wheatgrass, Thurber needlegrass, Sandberg bluegrass
L1	Rapid to moderate	Well drained	Parallel, Few	CW-G1-12 (6CA) CW-G1-11 (6CR) CD-G1-11 (6S)	Douglas-fir, ponderosa pine	Spirea, snowberry	Pinegrass, elk sedge, heartleaf arnica
L2	Rapid to moderate	Well drained	Dendritic, Moderate	CW-G1-12 (6CA)	Douglas-fir, ponderosa pine, larch	Spirea, snowberry	Pinegrass, elk sedge, heartleaf arnica
L3	Moderate	Well drained	Dendritic, Moderate	CD-G1-11 (6S) CW-G1-11 (6CR) GP-G1-12 (6F)	Ponderosa pine, Douglas-fir	Snowberry, bitterbrush	Elk sedge, pinegrass, heartleaf arnica, fescue
L5	Rapid	Well drained	Dendritic, Few	CL-G2-11 (6LS)	Lodgepole pine	Grouse huckleberry	Pinegrass

TABLE OF LANDTYPE CHARACTERISTICS, FEATURES, AND QUALITIES (CONTINUED)

LANDTYPE NO.	INFILTRATION CLASS	DRAINAGE CLASS	MAJOR DRAINAGE PATTERN AND INTENSITY	PLANT COMMUNITY TYPES	OVERSTORY SPECIES	UNDERSTORY SPECIES	GROUND COVER SPECIES
L6	Rapid	Well drained	Dendritic, Few	CW-F3-11 (7WF) CW-G1-12 (6CA)	Douglas-fir, white fir, larch, ponderosa pine	Spirea, snowberry	Pinegrass, elk sedge, heartleaf arnica, twinflower, columbia brome
L7	Moderately slow to moderate	Somewhat poorly to moderately well	Dendritic, Few	CW-G1-11 (6CR) CD-G1-11 (6S)	Ponderosa pine	Snowberry, bitterbrush	Pinegrass, elk sedge, heartleaf arnica, twinflower, columbia brome
L8	Rapid to moderate	Well	Dendritic, Few	CW-G1-12 (6CA)	Ponderosa pine, Douglas-fir, larch	Spirea, snowberry	Pinegrass, elk sedge, heartleaf arnica
M1	Variable	Poorly to moderately well	Dendritic, Few	MM (2M) MW (2W)	None	None	Moist Sites: Tufted hairgrass, bentgrass, Kentucky bluegrass. Wet Sites: Nebraska sedge, ovalhead sedge, bentgrass
M2	Variable	Poorly to moderately well drained	Dendritic, Few	MM (2M) MW (2W) MD (2D)	None	None	Wet Sites: Nebraska sedge, ovalhead sedge, bentgrass Moist Sites: Tufted harigrass, bentgrass, Kentucky bluegrass Dry Sites: Tufted hairgrass, Kentucky bluegrass, California oatgrass

TABLE OF LANDTYPE CHARACTERISTICS, FEATURES, AND QUALITIES (CONTINUED)

LANDTYPE NO.	INFILTRATION CLASS	DRAINAGE CLASS	MAJOR DRAINAGE PATTERN AND INTENSITY	PLANT COMMUNITY TYPES	OVERSTORY SPECIES	UNDERSTORY SPECIES	GROUND COVER SPECIES
M3	Variable	Moderately well to well	Dendritic, Few	MD (2D)	None	Dry Meadow Site: None Dry Meadow Fringes: Big sagebrush	Dry Meadow Site: Tufted hairgrass, Kentucky bluegrass, California oatgrass Dry Meadow Fringe: Wheatgrass, Sandberg bluegrass, prairie junegrass
M8	Variable	Moderately well to well drained	Dendritic, Few	MM (2M) MW (2W) MD (2D)	None	None	Wet Meadow Site: Nebraska sedge, ovalhead sedge, bentgrass Moist Meadow Site: Tufted hairgrass, bentgrass, Kentucky bluegrass Dry Meadow Site: Wheatgrass, Sandberg bluegrass, prairie junegrass
N1	Rapid	Well drained	Dendritic, Common	CW-G1-11 (6CR) CW-G1-12 (6CA)	White fir, Douglas-fir, ponderosa pine	Spirea, snowberry	Pinegrass, elk sedge, heartleaf arnica
N2	Rapid	Well drained	Dendritic, Common	CW-F3-11 (7WF) CW-S8-11 (7WS)	White fir, Douglas-fir, lodgepole pine, ponderosa pine	Grouse huckleberry	Pinegrass, Columbia brome, forbs
N3	Rapid	Well to moderately well drained	Dendritic, Few	CW-G1-11 (6CR) CW-G1-12 (6CA)	Ponderosa pine, Douglas-fir, white fir	Spirea, snowberry	Pinegrass, elk sedge, heartleaf arnica
N4	Moderate	Excessively drained	Dendritic, Few to Common	CP-G1-11 (6A) SD-29-11 (4T) CJ-2S-11 (9T) SD-49 (5C)	Juniper, ponderosa pine	Big sagebrush, mahogany	Fescue, wheatgrass, Sandberg bluegrass
N5	Moderate	Well drained	Dendritic, Few to Common	CP-G1-12 (6F) CP-G1-11 (6A)	Ponderosa pine	Bitterbrush, mahogany	Fescue, elk sedge, wheatgrass, Sandberg bluegrass

TABLE OF LANDTYPE CHARACTERISTICS, FEATURES, AND QUALITIES (CONTINUED)

LANDTYPE NO.	INFILTRATION CLASS	DRAINAGE CLASS	MAJOR DRAINAGE PATTERN AND INTENSITY	PLANT COMMUNITY TYPES	OVERSTORY SPECIES	UNDERSTORY SPECIES	GROUND COVER SPECIES
N6	Moderate	Well to moderately well drained	Dendritic, Few	CP-G1-12 (6F) CD-G1-11 (6S)	Ponderosa pine	Bitterbrush, mahogany	Fescue, wheatgrass, elk sedge, Sandberg bluegrass
N7	Moderate	Excessively drained	Dendritic, Few	CP-G1-11 (6A) SD-29-11 (4T) CJ-2S-11 (9T)	Juniper, ponderosa pine	Big sagebrush, mahogany	Fescue, wheatgrass, Sandberg bluegrass
N8	Moderate	Excessively drained	Dendritic, Few	SD-91-11 (4R) SD-19-11 (4A) GB-91-11 (1S)	None	Low sagebrush, stiff sagebrush	Wheatgrass, Sandberg bluegrass
N9	Moderate	Excessively drained	Dendritic, Common	SD-19-11 (4A) GB-49-13 (1ss)	None	Low sagebrush, stiff sagebrush	Wheatgrass, fescue, Sandberg bluegrass
P1	Rapid	Well drained	Dendritic, Few	CL-G2-11 (6LS) CL-S4-11 (7LS)	Lodgepole pine	Lodgepole pine, grouse huckleberry	Pinegrass, heartleaf arnica, pyrola
P2	Rapid	Well drained	Dendritic, Few	CW-G1-12 (6CA)	Ponderosa pine, Douglas-fir, white fir, larch	Spirea	Pinegrass, elk sedge, heartleaf arnica
P3	Rapid to moderate	Well drained	Dendritic, Few	CD-G1-11 (6S) GP-G1-12 (6F)	Ponderosa pine, Douglas-fir	Bitterbrush, mahogany	Elk sedge, fescue
P4	Moderate	Well	Dendritic, Few	SD-19-11 (4A) CJ-S1-11 (9A) CP-G1-11 (6A)	Juniper, ponderosa pine	Low sagebrush, mahogany, big sagebrush, bitterbrush	Wheatgrass, fescue, Sandberg bluegrass
P5	Slow to moderate	Well	Dendritic, Few	SD-91-11 (4R) CJ-S8-11 (9R) GP-91-11 (1s)	Juniper	Stiff sagebrush	None
P8	Moderate to rapid	Well	Parallel, Few	GP-G1-12 (6F) CD-G1-11 (6S)	Ponderosa pine, Douglas-fir	Bitterbrush, mahogany	Fescue, elk sedge
P9	Rapid	Well	Dendritic, Few	CW-G1-12 (6CA) CW-F3-11 (7WF)	White fir, Douglas-fir	Spirea	Columbia brome, twinflower, pinegrass, elk sedge, heartleaf arnica

TABLE OF LANDTYPE CHARACTERISTICS, FEATURES, AND QUALITIES (CONTINUED)

LANDTYPE NO.	INFILTRATION CLASS	DRAINAGE CLASS	MAJOR DRAINAGE PATTERN AND INTENSITY	PLANT COMMUNITY TYPES	OVERSTORY SPECIES	UNDERSTORY SPECIES	GROUND COVER SPECIES
Q1	Moderate	Well drained	Dendritic, Few	CP-S2-21 (6PR) CD-G1-11 (6S) CP-G1-12 (6F)	Ponderosa pine	Bitterbrush, mahogany	Ross sedge, fescue, wheatgrass, elk sedge
Q2	Rapid	Well drained	Dendritic, Common	CD-G1-11 (6S) CP-G1-12 (6F)	Ponderosa pine	Bitterbrush, mahogany	Fescue, wheatgrass, Sandberg bluegrass, elk sedge
Q3	Moderate	Excessively drained	Dendritic, Few	CP-G1-11 (6A) CJ-S1-11 (9A) CJ-2S-11 (9T) SD-29-11 (4T)	Juniper, ponderosa pine	Big sagebrush, bitterbrush, mahogany	Fescue, wheatgrass, Sandberg bluegrass
Q4	Moderate	Excessively drained	Dendritic, Common	CP-G1-11 (6A) CJ-S1-11 (9A) SD-29-11 (4T)	Juniper, ponderosa pine	Big sagebrush, bitterbrush, mahogany	Fescue, wheatgrass, Sandberg bluegrass
Q7	Moderate	Excessively drained	Dendritic, Few	SD-91-11 (4R) SD-19-11 (4A)	None	Stiff sagebrush, low sagebrush	Wheatgrass, Sandberg bluegrass
Q8	Rapid	Well drained	Dendritic, Few	CW-G1-11 (6CR) CW-G1-12 (6CA)	Ponderosa pine, Douglas-fir, white fir	Spirea, snowberry	Pinegrass, elk sedge, heartleaf arnica
Q9	Moderate to rapid	Well drained	Dendritic, Few	CW-G1-11 (6CR) CW-G1-12 (6CA)	Douglas-fir, ponderosa pine, white fir	Spirea, snowberry	Elk sedge, pinegrass, lupine, heartleaf arnica
R1	Rapid	Well drained	Parallel, Few	CW-G1-12 (6CA)	White fir, Douglas-fir, ponderosa pine	Spirea	Pinegrass, elk sedge
R2	Rapid	Well drained	Dendritic, Common	CW-G1=12 (6CA)	Douglas-fir, ponderosa pine, white fir	Spirea	Pinegrass, elk sedge
R3	Rapid	Well drained	Dendritic to Parallel, Few	CW-F3-11 (7WF) CW-G1-12 (6CA)	Douglas-fir, white fir, larch, ponderosa pine	Spirea	Pinegrass, elk sedge heartleaf arnica, twinflower, columbia brome

TABLE OF LANDTYPE CHARACTERISTICS, FEATURES, AND QUALITIES (CONTINUED)

LANDTYPE NO.	INFILTRATION CLASS	DRAINAGE CLASS	MAJOR DRAINAGE PATTERN AND INTENSITY	PLANT COMMUNITY TYPES		OVERSTORY SPECIES	UNDERSTORY SPECIES	GROUND COVER SPECIES
R4	Moderate	Well drained	Dendritic to Parallel, Common	CJ-G1-11 GB-49-13	(9B) (1ss)	Juniper, scattered wolf pine and wolf Douglas-fir	Mahogany, bitterbrush, big sagebrush	Wheatgrass, fescue, bluegrass
R5	Moderate	Well drained	Dendritic, Common	CJ-G1-11 GB-49-11	(9B) (1FS)	Juniper, scattered wolf pine and wolf Douglas-fir	Mountain mahogany, bitterbrush, big sagebrush	Wheatgrass, fescue, bluegrass
R6	Rapid	Well drained	Dendritic, Few	CW-G1-12 CW-F3-11	(6CA) (7WF)	Douglas-fir, ponderosa pine, white fir, western larch	Spirea	Pinegrass, elk sedge, heartleaf arnica, twinflower, columbia brome
R7	Rapid	Moderately well to Well	Dendritic, Few	CL-G2-11	(6LS)	Lodgepole pine, white fir	Grouse huckleberry	Pinegrass
S1	Variable	N/A	Dendritic, Few	Rockland	-	None	Stiff sagebrush	Bighead clover, biscuit root, Sandberg bluegrass, dwarf squirreltail
T2		Well drained	Dendritic, Common	CW-G1-12	(6CA)	Douglas-fir, ponderosa pine, larch	Spirea	Pinegrass, elk sedge, heartleaf arnica
T3	Moderate	Well drained	Dendritic, Common	CD-G1-11 CW-G1-11 CP-G1-12	(6S) (6CR) (6F)	Ponderosa pine, Douglas-fir	Bitterbrush, snowbrush	Elk sedge, pinegrass, heartleaf arnica, fescue
T5	Slow to Moderate	Well	Dendritic, Common	CP-G1-11 CJ-G1-11 CJ-S1-11	(6A) (9B) (9A)	Juniper, ponderosa pine	Big sagebrush, bitterbrush, low sagebrush	Wheatgrass, fescue, Sandberg bluegrass, yarrow
T6	Rapid	Well drained	Dendritic, Common	CW-F3-11 CW-G1-12	(7WF) (6CA)	Douglas-fir, white fir, larch, ponderosa pine		Pinegrass, elk sedge, heartleaf arnica, twinflower, columbia brome

TABLE OF LANDTYPE CHARACTERISTICS, FEATURES, AND QUALITIES (CONTINUED)

LANDTYPE NO.	INFILTRATION CLASS	DRAINAGE CLASS	MAJOR DRAINAGE PATTERN AND INTENSITY	PLANT COMMUNITY TYPES	OVERSTORY SPECIES	UNDERSTORY SPECIES	GROUND COVER SPECIES
T7	Moderate to Slow	Moderately well	Dendritic, Few	CW-G1-11 (6CR) CD-G1-11 (6S)	Ponderosa pine	Snowberry	Elk sedge, fescue
T8	Moderate to Rapid	Well drained	Dendritic, Common	CW-G1-12 (6CA)	Douglas-fir, ponderosa pine, larch	Spirea	Pinegrass, elk sedge, heartleaf arnica
U4	Rapid	Somewhat poorly to moderately well	Dendritic, Common	CW-G1-11 (6CR) CW-G1-12 (6CA)	Ponderosa pine, white fir, Douglas-fir	Spirea, snowberry	Pinegrass, elk sedge, heartleaf arnica
U5	Moderate	Well drained	Dendritic, Common	SD-29-11 (4T)	Juniper	Big sagebrush, bitterbrush	Idaho fescue
V1	Moderate	Well drained	Dendritic, Common	CJ-S2-11 (9T) CP-G1-11 (6A)	Juniper, ponderosa pine	Big sagebrush, mahogany, bitterbrush	Wheatgrass, Sandberg bluegrass, prairie junegrass, fescue
V2	Rapid	Well drained	Dendritic, Common to many	CW-G1-11 (6CR) CW-G1-12 (6CA)	Ponderosa pine, Douglas-fir, white fir	Spirea, snowberry	Pinegrass, elk sedge, heartleaf arnica
V3	Moderate	Well drained	Dendritic, Common to many	CP-G1-12 (6F) CD-G1-11 (6S)	Ponderosa pine	Bitterbrush, mahogany	Fescue, wheatgrass, elk sedge, Sandberg bluegrass
V4	Moderate	Excessively drained	Dendritic, Common to many	CP-G1-11 (6A) SD-29-11 (4T) CJ-S2-11 (9T)	Juniper, ponderosa pine	Big sagebrush, mahogany	Fescue, wheatgrass, Sandberg bluegrass
V5	Moderate	Excessively drained	Dendritic, Common to many	GB-49-13 (1ss) SD-29-11 (4T) SD-19-11 (4A)	None	Big sagebrush, rabbitbrush	Fescue, wheatgrass, Sandberg bluegrass
V6	Rapid	Well drained	Dendritic, Common to many	CW-S8-11 (7WS) CW-F3-11 (7WF)	White fir, Douglas-fir, western larch	Grouse huckleberry	Pinegrass, grouse huckleberry, columbia brome, forbs
V7	Moderate	Excessively drained	Dendritic, Common to many	GB-91-11 (1S) SD-29-11 (4T) SD-19-11 (4A)	None	Big sagebrush, rabbitbrush, low sagebrush	Fescue, wheatgrass, Sandberg bluegrass

TABLE OF LANDTYPE CHARACTERISTICS, FEATURES, AND QUALITIES (CONTINUED)

LANDTYPE NO.	INFILTRATION CLASS	DRAINAGE CLASS	MAJOR DRAINAGE PATTERN AND INTENSITY	PLANT COMMUNITY TYPES	OVERSTORY SPECIES	UNDERSTORY SPECIES	GROUND COVER SPECIES
V8	Rapid	Well drained	Dendritic, Few to Common	GD-G1-11 (6S) CP-G1-12 (6F)	Ponderosa pine, Douglas-fir	Mountain mahogany, snowberry, bitterbrush	Elk sedge, buckwheat, yarrow, Oregon grape, fescue
X3	Moderate	Well drained	Parallel, Few	CJ-S2-11 (9T) SD-29-11 (4T) SD-39 (5P)	Juniper	Big sagebrush, bitterbrush	Fescue, wheatgrass, cheatgrass
X6	Moderate to rapid	Well drained	Dendritic, Few	CW-G1-12 (6CA)	Douglas-fir, ponderosa pine	Spirea	Elk sedge, pinegrass, lupine, heartleaf arnica
X7	Moderate	Well drained	Dendritic, Few	CP-G1-11 (6A) CP-G1-12 (6F)	Ponderosa pine	Mahogany, big sagebrush	Fescue, squirreltail, wheatgrass
X8	Moderate	Well drained	Dendritic, Few	CJ-S1-11 (9A) SD-19-11 (4A) CJ-S2-11 (9T)	Juniper, ponderosa pine	Low sagebrush, bitterbrush, mahogany	Fescue, wheatgrass, Sandberg bluegrass, squirreltail, lomatium
X9	Moderate	Moderately well	Dendritic, Few	CP-G1-12 (6F) CD-G1-11 (6S)	Ponderosa pine	Bitterbrush, snowberry	Fescue, Sandberg bluegrass, wild onion
Y1	Moderate	Well drained	Dendritic, Few	SS-49-11 (4TA) GS-12-11 (1AF)	Scattered stands of subalpine fir, lodgepole, stunted Douglas-fir, white fir	Alpine sagebrush	Fescue, green fescue, ross sedge, elk sedge, yarrow, lupine
Y2	Rapid	Well drained	Parallel, Few to Common	CW-F3-11 (7WF) CW-G1-12 (6CA)	White fir, Douglas-fir, western larch	Spirea	Columbia brome, pinegrass, heartleaf arnica, pinegrass, lupine
Y3	Moderate	Well drained	Parallel, Few to Common	CP-G1-12 (6F) CD-G1-11 (6S) CW-G1-11 (6CR)	Ponderosa pine, Douglas-fir	Bitterbrush, snowberry	Fescue, elk sedge, pinegrass
Y4	Slow to Moderate	Well drained	Parallel, Few to Common	GB-49-14 (1SD) CJ-S1-11 (9A) SD-19-11 (4A) CP-G1-11 (6A)	Ponderosa pine in places on deeper soils	Low sagebrush, big sagebrush, bitterbrush	Wheatgrass, fescue, Sandberg bluegrass

TABLE OF LANDTYPE CHARACTERISTICS, FEATURES, AND QUALITIES (CONTINUED)

LANDTYPE NO.	INFILTRATION CLASS	DRAINAGE CLASS	MAJOR DRAINAGE PATTERN AND INTENSITY	PLANT COMMUNITY TYPES	OVERSTORY SPECIES	UNDERSTORY SPECIES	GROUND COVER SPECIES
Y7	Moderate	Moderately well	Dendritic, Few	CW-G1-11 (6CR) CL-S4-11 (6LS)	Lodgepole pine, white fir, Douglas-fir	Grouse huckleberry	Pinegrass, elk sedge, heartleaf arnica
Y8	Rapid	Well drained	Dendritic, Few	CE-S4-11 (7AS) CL-S4-11 (7LS)	Subalpine fir, lodgepole pine	Grouse huckleberry	Heartleaf arnica, pinegrass
Y9	Moderate	Well drained	Dendritic to Parallel, Few to Common	CD-G1-11 (6S) CW-G1-11 (6CR)	Ponderosa pine, Douglas-fir, white fir	Snowberry, spirea	Pinegrass, elk sedge, heartleaf arnica

TABLE OF LANDTYPE CHARACTERISTICS, FEATURES, AND QUALITIES (CONTINUED)

LANDTYPE NO.	RANGE OF MEAN ANNUAL PRODUCTION POTENTIALS 1/				POTENTIAL FERTILIZER RESPONSE
	TIMBER PRODUCTION			HERBAGE PRODUCTION	
		SITE CLASS BY SPECIES			
	CU. FT./AC.	P.P.	D.F.	POUNDS/ACRE	
A1	N/A	N/A	N/A	1400 - 2200	Moderate to High
A2	N/A	N/A	N/A	412 - 800	Moderate
A4	N/A	N/A	N/A	800 - 2200	Moderate to High
B1	N/A	N/A	N/A	150 - 400	Low
B4	N/A	N/A	N/A	150 - 400	Low
B5	N/A	N/A	N/A	150 - 400	Low
B6	30-53	5-4	5	300	Moderate
B7	19-43	5-4	N/A to 5	300 - 350	Low to Moderate
B8	43-53	4	5	300 - 350	Moderate to High
B9	43-115	N/A to 4	5	208 - 350	Moderate to High
C1	N/A	N/A	N/A	750 - 1600	Low
C2	43-115	4	5	210 - 330	Moderate to High
C3	31-43	5-4	5	310 - 340	Low to Moderate
C5	59-115	N/A	5	208 - 248	High
C6	0-10	N/A to 5	N/A	300 - 412	Low

1/ Adapted from Hall, 1973, pp. 4-47; except for Crooked River National Grassland landtypes, figures are from USDA Soil Conservation Service, OR-SOILS-1, forms.

TABLE OF LANDTYPE CHARACTERISTICS, FEATURES, AND QUALITIES (CONTINUED)

LANDTYPE NO.	RANGE OF MEAN ANNUAL PRODUCTION POTENTIALS				POTENTIAL FERTILIZER RESPONSE
	TIMBER PRODUCTION			HERBAGE PRODUCTION	
		SITE CLASS BY SPECIES			
	CU. FT./AC.	P.P.	D.F.	POUNDS/ACRE	
C7	19-31	5	5	341 - 359	Low
C8	43-53	4	5	309 - 330	Moderate
C9	29-115	N/A	N/A to 5	181 - 208	Low to Moderate
D1	N/A	N/A	N/A	-	Low
E1	N/A	N/A	N/A	700	Low
E2	N/A	N/A	N/A	1200 - 1600	Low
E3	N/A	N/A	N/A	750	Low
E4	N/A	N/A	N/A	1200	Low
E5	N/A	N/A	N/A	1200	Low
E6	N/A	N/A	N/A	700	Low
E7	N/A	N/A	N/A	700	Low
E8	N/A	N/A	N/A	1200	Low
F1	N/A	N/A	N/A	700	Low
F2	N/A	N/A	N/A	700	Low
G1	N/A	N/A	N/A	900	Low

TABLE OF LANDTYPE CHARACTERISTICS, FEATURES, AND QUALITIES (CONTINUED)

LANDTYPE NO.	RANGE OF MEAN ANNUAL PRODUCTION POTENTIALS				POTENTIAL FERTILIZER RESPONSE
	TIMBER PRODUCTION			HERBAGE PRODUCTION	
		SITE CLASS BY SPECIES			
	CU. FT./AC.	P.P.	D.F.	POUNDS/ACRE	
G2	N/A	N/A	N/A	700	Low
G3	N/A	N/A	N/A	500	Low
G7	N/A	N/A	N/A	1500	Low
H2	N/A	N/A	N/A	700	Low
H3	N/A	N/A	N/A	800	Low
J0	N/A	N/A	N/A	0 - 160	Low
J1	N/A	N/A	N/A	400	Low
J2	N/A	N/A	N/A	-	Low
J3	N/A	N/A	N/A	1200	High
J5	N/A	N/A	N/A	1200	Moderate
J6	N/A	N/A	N/A	700	Moderate
L1	31 - 53	5 - 4	5	309 - 341	Moderate
L2	53	4	5	330	Moderate to High
L3	19 - 43	5 - 4	N/A to 5	309 - 359	Low to Moderate
L5	45	N/A	5	274	Moderate

TABLE OF LANDTYPE CHARACTERISTICS, FEATURES, AND QUALITIES (CONTINUED)

LANDTYPE NO.	RANGE OF MEAN ANNUAL PRODUCTION POTENTIALS				POTENTIAL FERTILIZER RESPONSE
	TIMBER PRODUCTION			HERBAGE PRODUCTION	
		SITE CLASS BY SPECIES			
	CU. FT./AC.	P.P.	D.F.	POUNDS/ACRE	
L6	53 - 115	N/A to 4	5	208 - 330	High
L7	30-43	5-4	N/A to 5	309 - 341	Moderate
L8	53	4	5	330	Moderate
M1	N/A	N/A	N/A	1400 - 2200	High
M2	N/A	N/A	N/A	800 - 2200	High
M3	N/A	N/A	N/A	410 - 800	Moderate
M8	N/A	N/A	N/A	800 - 2200	Moderate to High
N1	43 - 53	4	6 - 5	309 - 330	Moderate
N2	59 - 115	N/A	5 - 6	208 - 248	High
N3	43 - 53	4	6 - 5	309 - 330	Moderate
N4	0 - 10	N/A to 5	N/A	366 - 429	Low
N5	10 - 19	5	N/A	359 - 429	Low
N6	19 - 31	5 - 4	6	341 - 359	Low
N7	0 - 10	N/A to 5	N/A	412 - 429	Low
N8	N/A	N/A	N/A	160 - 411	Low

TABLE OF LANDTYPE CHARACTERISTICS, FEATURES, AND QUALITIES (CONTINUED)

LANDTYPE NO.	RANGE OF MEAN ANNUAL PRODUCTION POTENTIALS				POTENTIAL FERTILIZER RESPONSE
	TIMBER PRODUCTION			HERBAGE PRODUCTION	
		SITE CLASS BY SPECIES			
	CU. FT./AC.	P.P.	D.F.	POUNDS/ACRE	
N9	N/A	N/A	N/A	300 - 411	Low
P1	35 - 45	N/A	5	116 - 274	Moderate
P2	53	4	5	330	Moderate
P3	19 - 31	5	N/A	341 - 359	Low
P4	0 - 10	N/A to 5	N/A	411 - 429	Low
P5	N/A	N/A	N/A	160 - 207	Low
P8	19 - 31	5	N/A	341 - 359	Low
P9	53 - 115	N/A to 4	6 - 5	208 - 330	Moderate to High
Q1	19 - 31	5	N/A to 6	194 - 359	Low
Q2	19 - 31	5	N/A to 6	341 - 359	Low
Q3	0 - 10	N/A to 5	N/A	411 - 429	Low
Q4	0 - 10	N/A to 5	N/A	411 - 429	Low
Q7	N/A	N/A	N/A	207 - 411	Low
Q8	43 - 53	5	6 - 5	309 - 330	Moderate
Q9	43 - 50	5	6 - 5	309 - 330	Moderate

TABLE OF LANDTYPE CHARACTERISTICS, FEATURES, AND QUALITIES (CONTINUED).

LANDTYPE NO.	RANGE OF MEAN ANNUAL PRODUCTION POTENTIALS				POTENTIAL FERTILIZER RESPONSE
	TIMBER PRODUCTION			HERBAGE PRODUCTION	
		SITE CLASS BY SPECIES			
	CU. FT./AC.	P.P.	D.F.	POUNDS/ACRE	
R1	53	4	6 - 5	330	Moderate
R2	53	4	6 - 5	330	Moderate
R3	53 - 115	N/A to 4	6 - 5	208 - 330	High
R4	N/A	N/A	N/A	300 - 363	Low
R5	N/A	N/A	N/A	363	Low
R6	53 - 115	N/A to 4	6 - 5	208 - 330	High
R7	45	N/A	5	274	Moderate
S1	N/A	N/A	N/A	N/A	Low
T2	53	4	5	330	Moderate to High
T3	19 - 43	5 - 4	N/A to 6-5	309 - 359	Low to Moderate
T5	0 - 10	N/A to 5	N/A	363 - 429	Low
T6	53 - 115	N/A to 4	6 - 5	208 - 330	High
T7	31 - 43	5 - 4	6 - 5	309 - 341	Low to Moderate
T8	53	4	5	330	Moderate
U4	43 - 53	4	6 - 5	309 - 330	Moderate

TABLE OF LANDTYPE CHARACTERISTICS, FEATURES, AND QUALITIES (CONTINUED)

LANDTYPE NO.	RANGE OF MEAN ANNUAL PRODUCTION POTENTIALS				POTENTIAL FERTILIZER RESPONSE
	TIMBER PRODUCTION			HERBAGE PRODUCTION	
		SITE CLASS BY SPECIES			
	CU. FT./AC.	P.P.	D.F.	POUNDS/ACRE	
U5	N/A	N/A	N/A	412	Low
V1	0 - 10	N/A to 5	N/A	412 - 429	Low
V2	43 - 53	4	6 - 5	309 - 330	Moderate
V3	19 - 31	5	N/A to 6	34 - 359	Moderate
V4	0 - 10	N/A to 5	N/A	412 - 429	Low
V5	N/A	N/A	N/A	300 - 412	Low
V6	59 - 115	N/A	6 - 5	208 - 248	High
V7	N/A	N/A	N/A	160 - 412	Low
V8	9 - 30	5	N/A to 6	341 - 359	Low
X3	N/A	N/A	N/A	375 - 412	Low
X6	53	4	5	330	Moderate
X7	10 - 19	5	N/A	359 - 429	Low
X8	N/A	N/A	N/A	412	Low
X9	19 - 31	5	N/A to 6	341 - 359	Low
Y1	N/A	N/A	N/A	254 - 383	Low

TABLE OF LANDTYPE CHARACTERISTICS, FEATURES, AND QUALITIES (CONTINUED)

LANDTYPE NO.	RANGE OF MEAN ANNUAL PRODUCTION POTENTIALS				POTENTIAL FERTILIZER RESPONSE
	TIMBER PRODUCTION			HERBAGE PRODUCTION	
		SITE CLASS BY SPECIES			
	CU. FT./AC.	P.P.	D.F.	POUNDS/ACRE	
Y2	53 - 115	N/A to 4	6 - 5	208 - 330	High
Y3	19 - 43	5 - 4	N/A to 6-5	309 - 359	Low to Moderate
Y4	0 - 10	N/A to 5	N/A	412 - 434	Low
Y7	35 - 43	N/A to 4	6 - 5	274 - 309	Moderate
Y8	29 - 35	N/A	N/A	116 - 181	Low to Moderate
Y9	31 - 43	4 - 5	6 - 5	312 - 341	Low to Moderate

Surface Soil Erosion Hazard

This rating is based on expected losses of surface soil when all vegetative cover, including litter, is removed. Evaluations of climate, slope gradient and length, soil characteristics, hydrologic characteristics of the soil, and bedrock materials of each landtype unit are considered in making ratings.

Slight - Little loss of soil materials is expected. Some minor sheet and rill erosion may occur. Less than 100 cubic feet/acre/year.

Moderate - Some loss of surface soil materials can be expected. Rill erosion and some small gullies or sheet erosion may occur. Sheet erosion is indicated by some soil pedestals and observable accumulation of soil materials along the upslope edge of rocks and debris. This is accompanied by a probable fertility loss. 100 to 200 cubic feet/acre/year.

Severe - Considerable loss of surface soil materials can be expected. Rill erosion, numerous small gullies, or evidence that considerable loss from sheet erosion may occur. Sheet erosion is indicated by frequent occurrence of soil pedestals and considerable accumulation of soil materials along the upslope edge of rocks and debris. This is accompanied by a fertility loss. 200 to 300 cubic feet/acre/year.

Very severe - Large loss of surface soil material can be expected in the form of large losses from sheet erosion, numerous small gullies and rills, or large gullies. Sheet erosion loss is exhibited by numerous examples of soil pedestals and extensive accumulation of soil materials along the upslope edge of rocks and debris. This is accompanied by a fertility loss. Over 300 cubic feet/acre/year.

Subsoil Erosion Hazard

This interpretation predicts the potential for subsoil erosion by water for each unit. It includes erosion which takes place after the surface soil has been removed such as in skid trails and firebreaks. Factors considered in making ratings are texture and structure of subsoil materials, slope, permeability, compaction, climate, and landform.

Low - Factors indicate that little or no erosion may occur.

Moderate - Factors indicate considerable erosion is likely to occur.

High - Factors indicate severe erosion is likely to occur.

Compaction Hazard

This interpretation refers to the relative ease soils of the landtypes can be compacted. (Compaction, as used here, is defined as the point at which the soil macroscopic pore space is reduced by one-half, or more, or when the bulk density is increased by twenty percent, or more, above the natural state.) Factors considered include: Texture, structure, coarse fragments, position, drainage, and precipitation.

Low - Factors indicate a low risk of soil compaction.

Moderate - Factors indicate a moderate risk of soil compaction.

High - Factors indicate a high risk of soil compaction.

Mixing and Displacement Hazard

This interpretation rates the landtypes as to the ease with which its soil material can be loosened and moved. Mixing and displacement can be done by hoof, foot, vehicular, or log traffic. Factors considered are soil texture, soil structural strength, bulk density, organic matter, coarse fragments, and root size and distribution.

Low - Factors indicate that these soils are not easy to loosen and/or displace.

Moderate - Factors indicate that these soils are moderately easy to loosen and/or displace.

High - Factors indicate that these soils are easy to loosen and/or displace.

Frost Heave Hazard

This interpretation rates the estimated susceptibility of each landtype to frost heave when subjected to freeze-thaw cycles. Factors considered are soil characteristics for adequate moisture supply, soil texture, slope gradient, and topographic position. Soils are rated without vegetative or litter cover. (Estimated damage to plant growth isn't intended here.)

Low - Little or no soil heave during freeze-thaw cycle.

Moderate - Moderate soil heave during freeze-thaw cycle.

High - Much soil heave during freeze-thaw cycle.

High Surface Soil Temperature Hazard

This is a relative prediction of the effect on the surface soil temperatures when vegetative cover and litter are removed. This will have an effect on the survival of seedlings. Factors considered are general aspect of the landtype, climatic zone, soil texture, soil color, water-holding capacity, and insulating effect of the soil material.

Low - Factors indicate that excessively high surface soil temperatures will not occur.

Moderate - Factors indicate that excessively high surface soil temperatures will occasionally occur which will result in some mortality.

High - Factors indicate that high surface soil temperatures will occur and result in significant mortality.

Estimated Available Water Capacity

Expressed in relative values for inches of water per inch of soil. The value shown reflects the effect of the texture, structure, and percentage of coarse fragments. This value excludes compensations for coarse fragments or bedrock. For purposes of comparison, the values have been divided into four groups that can be thought of as very low, low, moderate, and high in relation to their available water-holding capacity. Many landtypes will be listed in more than one group. These values do not represent compacted layers or bedrock.

Very low - Less than .06"/inch

Low - .07 through .12"/inch

Moderate - .13 through .16"/inch

High - Greater than .17"/inch

Dustiness Hazard

This interpretation is a relative prediction of soil behavior, assuming that the soils will be subjected to vehicular, hoof, foot, or logging traffic during the dry season. Factors considered are soil texture, soil structure, amount of coarse fragments, and individual soil particle characteristics.

Low - Factors indicate dust will be a minor problem.

Moderate - Factors indicate that under normal conditions, dust will be a minor problem, but under heavy use and extremely dry conditions, dust will be a problem.

High - Factors indicate that dust will be a major problem. Dust abatement measures will be necessary for some uses under normal conditions.

Muddiness Hazard

This is a relative prediction of surface soil behavior when subjected to vehicular, hoof, and/or foot traffic during periods of time when the soil moisture is at or above field capacity. Factors considered are soil texture, percent of coarse rock material, clay content, and soil parent material.

Low - Factors indicate that muddiness is not likely to be a problem.

Moderate - Factors indicate that muddiness will occasionally be a problem for intensive use. Special restrictions or surfacing may occasionally be necessary for intensive use.

High - Factors indicate that muddiness will be a problem for intensive use with restrictions and surfacing necessary.

TABLE OF INTERPRETATIONS - GENERAL

LANDTYPE NO.	SURFACE SOIL 1/ EROSION HAZARD / SLOPE & RATING	SUBSOIL EROSION HAZARD	COMPACTION HAZARD	MIXING AND DISPLACEMENT HAZARD	FROST HEAVE HAZARD	HIGH SURFACE SOIL TEMPERATURE HAZARD	ESTIMATED AVAILABLE WATER CAPACITY / SURFACE LAYERS / SUBSOIL LAYERS	DUSTINESS HAZARD	MUDDINESS HAZARD
A1	Slight - Moderate	Low	High	Low	High	Low	Moderate - High / Very low - High	Low	High
A2	Slight - Moderate	Low - Moderate	High	Low	Moderate - High	Low - High	Moderate - High / Very low - High	High	Moderate - High
A4	Slight - Moderate	Low - Moderate	High	Low	Moderate - High	Low - High	High / High	Low - High	Moderate - High
B1	35-50% Severe 50%+ Very severe	High	Moderate - High	Low - Moderate	Moderate - High	Low - High	Moderate - High / Moderate - High	Low - High	Moderate - High
B4	35-50% Severe 50%+ Very severe	High	Moderate - High	Low - Moderate	Moderate - High	Low - High	Low - High / Low - High	Low - High	Moderate - High
B5	0-15% Slight 15-35% Moderate	Moderate	Moderate - High	Low	Moderate - High	Low - High	Low - High / Low - High	Low - High	Moderate - High
B6	0-10% Slight 10-20% Moderate	Low	Moderate - High	Moderate	High	High	High / Low - High	High	Low - Moderate
B7	30-50% Severe 50%+ Very severe	High	Moderate - High	Moderate - High	Low - Moderate	High	Low - High / Low - Moderate	High	Low
B8	30-50% Severe 50-70% Very severe	High	High	Moderate - High	Moderate	High	High / Low - High	High	Low
B9	30-50% Severe 50-70% Very severe	High	Moderate - High	Moderate - High	Low - Moderate	Low	Moderate - High / Low - Moderate	High	Low
C1	15-100% Moderate to Severe	Variable	Low - Moderate	Moderate - High	Low - Moderate	Low - High	Very low - High / Very low - High	Low - High	Low - High
C2	15-100% Moderate to Very severe	Variable	Moderate - High	Moderate - High	Low - Moderate	Low	Moderate - High / Not Rated	High	Low
C3	15-100% Moderate to Very severe	Variable	High	Moderate - High	Low - Moderate	High	Low - Moderate / Not Rated	Moderate - High	Low - Moderate
C5	15-100% Moderate to Very severe	Variable	Low - Moderate	High	High	Low	Not Rated	High	Low

1/ Used guidelines from Anderson, 1969.

TABLE OF INTERPRETATIONS - GENERAL

LANDTYPE NO.	SURFACE SOIL EROSION HAZARD / SLOPE & RATING	SUBSOIL EROSION HAZARD	COMPACTION HAZARD	MIXING AND DISPLACEMENT HAZARD	FROST HEAVE HAZARD	HIGH SURFACE SOIL TEMPERATURE HAZARD	ESTIMATED AVAILABLE WATER CAPACITY / SURFACE LAYERS / SUBSOIL LAYERS	DUSTINESS HAZARD	MUDDINESS HAZARD
C6	15-100% Moderate to Very severe	Variable	Moderate - High	Moderate	Low	High	Not Rated	Moderate	Moderate - High
C7	15-100% Moderate to Very severe	Variable	High	Moderate	Low	Low	Not Rated	Moderate	Moderate - High
C8	15-100% Moderate to Very severe	Variable	High	High	Moderate	Low	Not Rated	High	Low
C9	15-100% Moderate to Very severe	Variable	Moderate - High	Moderate - High	Moderate	Low	Moderate - High / Not Rated	High	Low
D1	0-15% Slight	Low	Low - Moderate	Moderate	Moderate	High	Moderate - High / N/A	High	Low
E1	0-15% Slight	Low - Moderate	High	Moderate	Moderate	Low - High	Low - High / Moderate - High	High	Moderate
E2	15-40% Moderate	Low - High	Moderate - High	High	Moderate	Low - High	Moderate - High / Low - High	High	Low
E3	2-15% Slight	Low - Moderate	Moderate - High	High	Moderate	Low - High	Moderate - High / Low - High	High	Low
E4	0-10% Slight 10-20% Moderate	Low - High	Moderate - High	Low	High	Low - High	Low - High / Low - High	Moderate	Moderate
E5	0-10% Slight 10-20% Moderate 20-40% Severe	Low - High	High	Low	High	Low - High	Very low - Mod. / Low - Moderate	Moderate	Moderate
E6	0-10% Slight 10-15% Moderate	Low - Moderate	High	Low	High	Low - High	Moderate - High / Very low - High	Moderate	Moderate
E7	15-20% Moderate 20-30% Severe 30%+ Very severe	Moderate - High	High	Moderate	Moderate	High	Low - High / Moderate - High	High	Moderate
E8	0-10% Moderate 10-20% Severe	Low - Moderate	High	Low	Moderate - High	Low - High	Moderate / Moderate - High	Moderate	Moderate
F1	0-15% Slight	Low - Moderate	Moderate - High	High	Moderate	Low - High	High / Moderate - High	High	Low

TABLE OF INTERPRETATIONS - GENERAL

LANDTYPE NO.	SURFACE SOIL EROSION HAZARD / SLOPE & RATING	SUBSOIL EROSION HAZARD	COMPACTION HAZARD	MIXING AND DISPLACEMENT HAZARD	FROST HEAVE HAZARD	HIGH SURFACE SOIL TEMPERATURE HAZARD	ESTIMATED AVAILABLE WATER CAPACITY / SURFACE LAYERS / SUBSOIL LAYERS	DUSTINESS HAZARD	MUDDINESS HAZARD
F2	0-8% Slight	Low	Moderate - High	High	Moderate	Low - High	Low - Moderate / Very low	High	Low
G1	0-15% Slight 15-40% Moderate	Moderate - High	High	Low	High	Low	Moderate - High / Low - Moderate	Moderate	High
G2	0-15% Slight 15-30% Moderate	Moderate - High	High	Low	High	High	Moderate - High / Low - Moderate	Moderate	High
G3	30-60% Severe 60%+ Very severe	High	High	Low	High	High	Moderate - High / Low - Moderate	Moderate	High
G7	30-60% Severe 60%+ Very severe	High	High	Low	Moderate	Low	High / Moderate - High	Moderate	High
H2	0-10% Slight 10-20% Moderate 20%+ Severe	Low - High	Moderate	Low	Moderate - High	Low - High	Low - Moderate / Very low - Mod.	Moderate	Moderate
H3	30-50% Severe 50%+ Severe	High	Moderate	Low	Moderate - High	High	Low - Moderate / Very low - Mod.	Low - Moderate	Moderate
J0	0-15% Slight to Moderate	N/A	Low - High	Low	Moderate	High	Very low - Mod. / N/A	Low - Moderate	Low - High
J1	0-10% Slight 10%+ Moderate	Low - Moderate	Moderate - High	Low	Moderate	High	Very low - Mod. / N/A	Low - Moderate	Moderate
J2	30-70% Moderate to Very severe	Variable	Moderate - High	Low - High	Variable	Low - High	Very low - High / Very low - High	Moderate - High	Moderate - High
J3	0-10% Slight 15%+ Moderate	Low - High	High	Low	Moderate - High	Low - High	Low - Moderate / Low - Moderate	Moderate - High	Moderate
J5	30-50% Severe 50%+ Very severe	High	Moderate - High	Low	Moderate	High	Very low - High / Low	Moderate	High
J6	30-50% Severe 50%+ Very severe	High	High	Low	Moderate - High	High	Low - Moderate / Low - Moderate	Moderate - High	Moderate
L1	20-50% Slight to Severe	Moderate - High	Low - High	Low	Low - Moderate	Low - High	Moderate / Low - Moderate	Moderate	Low

TABLE OF INTERPRETATIONS - GENERAL

LANDTYPE NO.	SURFACE SOIL EROSION HAZARD SLOPE & RATING	SUBSOIL EROSION HAZARD	COMPACTION HAZARD	MIXING AND DISPLACEMENT HAZARD	FROST HEAVE HAZARD	HIGH SURFACE SOIL TEMPERATURE HAZARD	ESTIMATED AVAILABLE WATER CAPACITY SURFACE LAYERS / SUBSOIL LAYERS	DUSTINESS HAZARD	MUDDINESS HAZARD
L2	0-10% Slight 10-20% Moderate 20-30% Severe 30%+ Very severe	Low - High	High	Moderate	High	Low	High / Low - High	High	Low -
L3	0-10% Slight 10-20% Moderate 20-30% Severe 30%+ Very severe	Low - High	High	Low Moderate	High	High	Low - Moderate / Low - High	Moderate - High	Moderate - High
L5	0-15% Slight 15-35% Moderate	Low	High	High	Moderate	Low - High	High / Low - High	High	Low
L6	0-20% Slight 20-40% Moderate 40%+ Severe	Low - High	High	High	Moderate	Low	High / Low - High	High	Low
L7	0-15% Slight 15-35% Moderate	Low - Moderate	High	Low	High	High	High / Low - High	Moderate	High
L8	0-10% Slight 10-20% Moderate 20-30% Severe 30%+ Very severe	Low - High	High	Moderate	High	High	High / Moderate - High	High	Low - Moderate
M1	0-10% Slight	Low	High	Low	High	Low - High	High / Moderate - High	Moderate	High
M2	0-30% Slight to Moderate	Low	High	Low	High	Low - High	High / Moderate - High	Moderate	High
M3	0-10% Slight	Low	High	Low	High	Low - High	High / Moderate - High	High	Moderate - High
M8	0-10% Slight	Low	High	Low	High	Low - High	High / Moderate - High	High	Moderate - High
N1	30-60% Severe 60%+ Very severe	High	High	Moderate	Moderate	Low	High / Moderate	High	Low - Moderate
N2	30-60% Severe 60%+ Very severe	High	High	High	Moderate	Low	High / Moderate	High	Low

TABLE OF INTERPRETATIONS - GENERAL

LANDTYPE NO.	SURFACE SOIL EROSION HAZARD / SLOPE & RATING	SUBSOIL EROSION HAZARD	COMPACTION HAZARD	MIXING AND DISPLACEMENT HAZARD	FROST HEAVE HAZARD	HIGH SURFACE SOIL TEMPERATURE HAZARD	ESTIMATED AVAILABLE WATER CAPACITY / SURFACE LAYERS / SUBSOIL LAYERS	DUSTINESS HAZARD	MUDDINESS HAZARD
N3	0-10% Slight 10-20% Moderate 20%+ Severe	Low - High	High	Moderate	Moderate	Low	High / Moderate	High	Low - Moderate
N4	30-50% Severe 50%+ Very severe	N/A	Moderate	Low - Moderate	Moderate	High	Low - Moderate / N/A	Low - Moderate	Low - Moderate
N5	30-60% Severe 60%+ Very severe	High	Moderate - High	Low - Moderate	Low	High	Moderate / Low - Moderate	Moderate	Moderate - High
N6	0-15% Slight 15-30% Moderate	Low - High	High	Low - Moderate	Low	High	Moderate / Low - Moderate	Moderate	Moderate - High
N7	0-15% Slight 15%+ Moderate	N/A	Low - Moderate	Low - Moderate	Low - Moderate	High	Low - Moderate / N/A	Low - Moderate	Low - Moderate
N8	0-15% Slight 15%+ Moderate	N/A	Low	Low - Moderate	Low - Moderate	High	Low - Moderate / N/A	Low	Low
N9	30-50% Severe 50%+ Very severe	N/A	Low	Moderate	Low	High	Low - Moderate / N/A	Low	Low
P1	0-15% Slight 15%+ Moderate	Low	High	High	Moderate	Low - High	High / Low - Moderate	High	Low
P2	0-15% Slight 15-35% Moderate	Low - High	High	Moderate - High	Moderate	Low	High / Low - High	High	Low
P3	0-15% Slight	Low	High	Moderate - High	Moderate - High	High	Moderate - High / Low - High	High	Low
P4	0-10% Slight 10-20% Moderate	Low	High	Low - Moderate	High	High	Moderate - High / Low - High	High	Moderate - High
P5	0-10% Slight 10-20% Moderate	Low	Moderate - High	Low	Moderate - High	High	Low - High / Low - High	Low - Moderate	High
P8	15-30% Moderate	Moderate - High	High	Low	Moderate - High	High	Moderate - High / Low - High	High	Low - Moderate
P9	0-15% Slight	Low	High	High	Moderate	Low - High	High / Moderate - High	High	Low
Q1	0-15% Slight 15%+ Moderate	Low - High	High	Moderate	Low	High	Moderate / Moderate	Moderate - High	Moderate

TABLE OF INTERPRETATIONS - GENERAL

LANDTYPE NO.	SURFACE SOIL EROSION HAZARD / SLOPE & RATING	SUBSOIL EROSION HAZARD	COMPACTION HAZARD	MIXING AND DISPLACEMENT HAZARD	FROST HEAVE HAZARD	HIGH SURFACE SOIL TEMPERATURE HAZARD	ESTIMATED AVAILABLE WATER CAPACITY / SURFACE LAYERS / SUBSOIL LAYERS	DUSTINESS HAZARD	MUDDINESS HAZARD
Q2	0-20% Slight 20-35% Moderate 35%+ Severe	Low - High	High	Moderate - High	Low	Low	Moderate / Moderate	High	Low
Q3	0-15% Slight 15%+ Moderate	N/A	Low	Moderate	Low - Moderate	High	Moderate / N/A	Moderate	Low
Q4	30-50% Severe 50%+ Very severe	N/A	Low	Moderate	Low	High	Moderate / N/A	Moderate	Low
Q7	0-30% Slight	N/A	Low	Low	Low - Moderate	High	Low - Moderate / N/A	Low	Low
Q8	0-10% Slight 10-20% Moderate 20%+ Severe	Low - High	High	Moderate	Moderate	Moderate	High / Moderate	High	Low
Q9	0-20% Slight 20-35% Moderate 35%+ Severe	Low - High	High	High	Moderate	Moderate	High / Moderate	High	Low
R1	30-60% Severe 60%+ Very severe	High	High	High	Moderate	High	High / Low - Moderate	High	Low
R2	0-15% Slight 15-30% Moderate	Low - Moderate	High	Moderate	Moderate	High	High / Low - Moderate	High	Low
R3	30-60% Severe 60%+ Very severe	High	High	High	Moderate	Low	High / Low - Moderate	High	Low
R4	30-50% Severe 50%+ Very severe	N/A	High	Low - Moderate	Moderate	Low - High	Low - Moderate / N/A	High	Moderate - High
R5	0-10% Slight 10-20% Moderate 20%+ Severe	N/A	High	Low	Moderate	Low - High	Low - Moderate / N/A	High	Moderate - High
R6	0-15% Slight 15-30% Moderate	Low - Moderate	High	Moderate	Moderate	Low	High / Low - Moderate	High	Low
R7	0-15% Slight 15-30% Moderate	Low - Moderate	High	High	Moderate	Low - High	High / Low - Moderate	High	Low
S1	0-15% Slight	N/A	Low	Low	Moderate	High	Very low / N/A	Low - Moderate	Low - High

TABLE OF INTERPRETATIONS - GENERAL

LANDTYPE NO.	SURFACE SOIL EROSION HAZARD / SLOPE & RATING	SUBSOIL EROSION HAZARD	COMPACTION HAZARD	MIXING AND DISPLACEMENT HAZARD	FROST HEAVE HAZARD	HIGH SURFACE SOIL TEMPERATURE HAZARD	ESTIMATED AVAILABLE WATER CAPACITY / SURFACE LAYERS / SUBSOIL LAYERS	DUSTINESS HAZARD	MUDDINESS HAZARD
T2	0-10% Slight 10-20% Moderate 20-30% Severe 30%+ Very severe	Low - High	High	Moderate	Moderate - High	Low	High / Low - High	High	Low - Moderate
T3	0-10% Slight 10-20% Moderate 20-30% Severe 30%+ Very severe	Low - High	High	Moderate	High	High	Low - Moderate / Low - High	Moderate - High	Moderate - High
T5	0-15% Slight 15-35% Moderate 35%+ Severe	Low - High	High	Low	High	Low - High	High / Moderate - High	Moderate	High
T6	0-20% Slight 20-40% Moderate 40%+ Severe	Low - High	High	High	Moderate	Low	High / Low - High	High	Low
T7	0-15% Slight 15-35% Moderate	Low - High	High	Low	High	Low - High	High / Moderate - High	Moderate	High
T8	0-10% Slight 10-20% Moderate 20-30% Severe 30%+ Very severe	Low - High	High	Moderate	Moderate - High	High	High / Low - High	High	Low - Moderate
U4	0-10% Slight 10-20% Moderate 20%+ Severe	Low - High	High	Moderate	Low	Low	High / Low - Moderate	High	Low - Moderate
U5	0-20% Slight 20%+ Moderate	Low - High	High	Moderate	Moderate	Low - High	Moderate - High / Moderate	Moderate	High
V1	0-10% Slight 10-20% Moderate 20%+ Severe	Low - High	High	Moderate - High	Moderate - High	Low - High	Moderate / Moderate	Moderate	Moderate - High
V2	30-60% Severe 60%+ Very severe	High	High	Moderate	High	Low - High	High / Low - Moderate	High	Low
V3	30-60% Severe 60%+ Very severe	High	Moderate	Moderate	Low	High	Moderate - High / Moderate	Moderate	Low

TABLE OF INTERPRETATIONS - GENERAL

LANDTYPE NO.	SURFACE SOIL EROSION HAZARD / SLOPE & RATING	SUBSOIL EROSION HAZARD	COMPACTION HAZARD	MIXING AND DISPLACEMENT HAZARD	FROST HEAVE HAZARD	HIGH SURFACE SOIL TEMPERATURE HAZARD	ESTIMATED AVAILABLE WATER CAPACITY / SURFACE LAYERS / SUBSOIL LAYERS	DUSTINESS HAZARD	MUDDINESS HAZARD
V4	10-35% Moderate 35-50% Severe 50%+ Very severe	N/A	Moderate	Moderate	Low	High	Low - Moderate / N/A	Moderate	Low
V5	30-50% Severe 50%+ Very severe	N/A	Low	High	Low	High	Very low - Low / N/A	Moderate	Low
V6	30-50% Severe 50%+ Very severe	High	High	High	High	Low	High / Low - Moderate	High	Low
V7	0-10% Slight 10-20% Moderate 20%+ Severe	N/A	Moderate	Moderate - High	Low	High	Low - Moderate / N/A	Moderate	Low
V8	0-10% Slight 10-20% Moderate 20%+ Severe	Low - High	High	Low - Moderate	Moderate		Low - Moderate / Low - High	High	Low
X3	20-30% Severe 30-50% Very severe	High	High	Moderate - High	Moderate	Low - High	Moderate - High / High	High	Low
X6	0-15% Slight	Low	High	Low - Moderate	Moderate - High	Low	Moderate - High / Low - High	High	Low
X7	0-15% Slight	Low	Moderate - High	Low	Moderate - High	Low - High	Low - Moderate / Low - Moderate	High	Low
X8	0-15% Slight	Low - Moderate	High	Low	High	Low - High	Moderate - High / Moderate	Moderate - High	High
X9	0-15% Slight	Low - Moderate	High	Low	High	Low - High	Moderate - High / Moderate	Moderate	High
Y1	0-10% Slight 10-20% Moderate 20-35% Severe	Low - High	High	Moderate - High	Moderate	Low - High	Moderate - High / Low - Moderate	High	Moderate - High
Y2	30-60% Severe 60%+ Very severe	Moderate - High	Moderate - High	Moderate - High	Low	Low	Moderate - High / Low - Moderate	High	Low
Y3	30-60% Severe 60%+ Very severe	Moderate - High	High	Moderate	Moderate	High	Low - High / Very low - Mod.	High	Low - Moderate

TABLE OF INTERPRETATIONS - GENERAL

LANDTYPE NO.	SURFACE SOIL EROSION HAZARD / SLOPE & RATING	SUBSOIL EROSION HAZARD	COMPACTION HAZARD	MIXING AND DISPLACEMENT HAZARD	FROST HEAVE HAZARD	HIGH SURFACE SOIL TEMPERATURE HAZARD	ESTIMATED AVAILABLE WATER CAPACITY / SURFACE LAYERS / SUBSOIL LAYERS	DUSTINESS HAZARD	MUDDINESS HAZARD
Y4	30-70% Very severe	Moderate High	Moderate - High	Low - Moderate	Moderate	High	Low - High / Low - High	Moderate - High	Moderate - High
Y7	0-10% Slight 10%+ Moderate	Low - Moderate	High	Moderate	High	High	Moderate - High / Low - High	Moderate - High	High
Y8	0-15% Slight 15%+ Moderate	Low - High	High	Moderate - High	Moderate - High	Low	Moderate - High / Moderate - High	High	Low
Y9	20-35% Moderate 35-60% Severe	Moderate - High	Moderate - High	Low - Moderate	Moderate	High	Low - High / Low - Moderate	High	Low - Moderate

TABLE OF INTERPRETATIONS - ENGINEERING

Generally, the following interpretations and ratings are based on the entire landtype unit including soil, bedrock, and landform. Some interpretations are based only on the soil material or bedrock material. These are stated in the description for each interpretation. The interpretations pertaining to roads are based on standard Forest Service regulations and construction methods presently used.

Unified Classification

Each soil is classified as to its unified classification. Some soils will be classified into one class but most will show a range of classes. Those soils with significant layers of different soil materials will have a classification for each layer designated. The classification has been made for some representative soils by laboratory testing. They are indicated by the use of asterisks. Those soils not tested will be classified by comparing their properties to those tested.

Materials Source

Topsoil

This rating evaluates each soil as to its suitability for use as topsoil. It does not specify any particular use of the topsoil. Ratings are based on soil characteristics.

Suited - Soil texture ranges from sandy loam to clay loam; gravel content is less than 35 percent and soil layer is at least 3 feet thick.

Unsuited - This rating indicates the soils do not satisfy the requirements specified under "suited". However, soils rated "unsuited" may still satisfy a particular requirement. See the "Table of Soil Characteristics" for soil texture, thickness, and gravel content.

Sand/Gravel

This interpretation indicates the suitability of each soil as a possible source of sand and/or gravel. It does not indicate the kind or quality of sand or gravel or refer to any specific use of the sand and/or gravel.

Suited - This rating indicates that sand and/or gravel is present and the following conditions are satisfied: There is a layer present which is composed of 80 percent, by volume, of sand and/or gravel. This layer is at least 4 feet thick.

Unsuited - This rating indicates that sand and/or gravel is generally not present in amounts which satisfy the

requirements under "suited". However, soils rated "unsuited" may still satisfy a particular requirement. See the "Table of Soil Characteristics" for soil depth and gravel content.

Clay

This rating indicates the suitability of each soil as a possible source of clay. It does not indicate the kind or quality of clay or refer to any specific use of the clay.

Suited - This rating indicates that the soil is a possible source of clay. Soils with this rating have the following: Texture ranges from clay loam to clay. Gravel content is less than 35 percent. This layer is at least 2 feet thick.

Unsuited - Soils with this rating generally are not possible sources for clay.

Road Rock

This interpretation indicates the general stability of rock when used as road rock for base course or wearing surface. These ratings are based on rock hardness, density, and susceptibility to weathering and breakdown. Soils are not rated when depth to bedrock is greater than 12 feet. (Cautionary note: This information is for broad planning purposes only. Specific onsite characterization data are required to accurately determine rock suitability.)

Unsuited - Rock is soft and breaks down rapidly under logging traffic.

Poor - Rock is only moderately hard and breaks down easily under logging traffic, usually in one or two years' time.

Fair - Rock is hard and dense but tends to break down under logging traffic after about two to four years' use.

Good - Rock is hard, dense, and resists breakdown under logging traffic.

Estimation of Road Rock Thickness

This interpretation refers to estimated amount of crushed road rock (base and/or surface) generally needed on heavy-vehicle, all-weather use roads constructed on each soil. Factors involved in making this interpretation include field observations, texture and plasticity of soil, depth of bedrock, drainage, and kind of subgrade the road generally will have - common material or bedrock. Ratings are based on compacted fills and on the use of high quality rock. (Cautionary note: This information is for broad planning purposes only. Specific onsite characterization data are required to accurately determine thickness needs.)

Very thin - Generally less than 6 inches.

Thin - Approximately 6 to 12 inches.

Thick - Approximately 12 to 24 inches.

Very thick - Generally over 24 inches.

Considerations for Road Location and Design

This column indicates the major considerations for road location and construction through each soil. The rating evaluates the impact of road construction on other resources and/or road construction problems likely to be encountered.

Road Cutbanks

Potential for Cutbank and Ditch Erosion

This interpretation indicates the potential for subsoil erosion by running water of each soil. It includes erosion which takes place along road ditches and on cutslopes, Rating is of soil material only and does not apply when cutbank or ditch is in bedrock. Factors considered in making ratings are field observations, texture and structure of subsoil materials, permeability, compaction, and climate.

Low - Factors indicate that little or no subsoil erosion is likely to occur.

Moderate - Factors indicate that the subsoils have moderate erosion potential.

High - Factors indicate that the subsoils are likely to erode severely.

Potential for Cutbank Sloughing and Raveling

This rating evaluates each unit for its susceptibility to sloughing or raveling after excavation. Factors include field observations, soil and bedrock characteristics, backslope ratio, frost action, climate, and potential for revegetation.

Low - Sloughing and/or raveling is a minor problem requiring occasional road maintenance.

Moderate - Sloughing and/or raveling causes some damage. Annual road maintenance is usually adequate.

High - Sloughing and raveling occur at a rate that often plugs culverts and fills inside ditches. Frequent road maintenance with heavy equipment such as front-end loader is required.

Estimation of Cutslope Ratio

This interpretation estimates the cutslope ratio which generally will result in the most stable cutbank condition. Ratings pertain both to soil and bedrock material. Ratings are based on soil and bedrock factors and on observations. (Cautionary note: This information is for broad planning purposes only. Specific onsite characterization data is needed to determine the proper ratio.)

Steep - Cutbank ratio from vertical to ¼:1.

Moderate - Cutbank ratio from about 1:1 to 1½:1.

Flat - Cutbank ratio flatter than 1½:1.

Suitability of Cutbank Seeding

This interpretation indicates the probable success of cutbank seeding. Factors considered in making ratings are soil characteristics, elevation, slope, climate, snowpack, and frost hazard. Ratings are based on current methods and practices of seeding, grass species, fertilizer application, and time of seeding.

Poor - Probability of success is low. Seeding generally is not successful and requires three or more reseedings and special treatments.

Fair - Success is likely on about 50 percent of area treated. Requires one or two follow-up treatments. Seeding is usually spotty; some areas become easily established while others fail completely.

Good - Probability of high success. Seeding usually becomes well established within two years. Little follow-up seeding necessary.

Limitations to Cutbank Seeding

This indicates the major limitations to success of cutbank seeding.

Stability

Natural Stability

This rating is based on the relative stability of the mapping units as they occur in the natural state. This includes any movement or loss other than surface erosion. Kinds of movement include slumps, slides, and all kinds of deep-seated failures. This rating applies throughout Region 6.

Very stable - No evidence of failure.

Stable - Occasional failures are observed.

Moderately stable - Several failures are observed.

Unstable - Many failures are observed.

Very unstable - Entire area shows evidence of recent and past failures.

Nature of Mass Movement

This is an estimation of the kind and/or size of mass movement observed.

Possible Stability Changes From Roadbuilding

This rating indicates the expected mass movement resulting from roadbuilding activities as compared to stability under natural conditions. Ratings are based on soil and bedrock characteristics, slopes, revegetation potential, and effects of timber removal, road construction, and fire.

Unchanged - The expected mass movement is relatively unchanged from that of the natural state.

Increased - The expected mass movement is greater than that of the natural state.

Greatly increased - The expected mass movement is much greater than that of the natural state.

TABLE OF INTERPRETATIONS - ENGINEERING

LANDTYPE NO.	UNIFIED CLASSIFICATION	MATERIALS SOURCE				ESTIMATION OF ROAD ROCK THICKNESS	CONSIDERATIONS FOR ROAD LOCATION AND DESIGN
		TOPSOIL	SAND/GRAVEL	CLAY	ROAD ROCK		
A1	Not rated	Suited	Unsuited	Unsuited	Unsuited	Very thick	Seasonal high water tables, seeps, flooding
A2	Not rated	Suited	Unsuited	Unsuited	Unsuited	Thin - Thick	Meandering stream channels
A4	Not rated	Suited	Unsuited	Unsuited	Unsuited	Variable	High water table, flooding, meandering stream channels
B1	GMu, SMu, ML	Unsuited	Unsuited	Unsuited	Poor - Fair	Thin	Steep slopes, rock fall, dissected slopes, shallow soils, damage from sidecast waste
B4	GMu, SMu, ML	Unsuited	Unsuited	Unsuited	Poor - Fair	Thin	Steep slopes, shallow soils, rock outcropping, damage from sidecast waste, high surface runoff potential
B5	GMu, SMu	Unsuited	Unsuited	Unsuited	Poor - Fair	Thin	Shallow soils, rock outcropping
B6	SM, ML / CL, ML, GM	Unsuited	Unsuited	Unsuited	Poor - Good	Thin - Thick	Shallow soils locally
B7	GM* / GM GC	Unsuited	Unsuited	Unsuited	Poor - Fair	Thin	Steep slopes, rock outcroppings, dissected slopes, damage cast waste problem
B8	SM, ML / GM, GC	Unsuited	Unsuited	Unsuited	Poor - Fair	Thin - Thick	Steep slopes, rock outcroppings, dissected slopes, damage from sidecast waste
B9	SM*, GM / GM, GC	Unsuited	Unsuited	Unsuited	Poor - Fair	Thin	Steep slopes, rock outcroppings, dissected slopes, damage from sidecast waste
C1	Not rated	Unsuited	Unsuited	Unsuited	Unsuited - Good	Variable	Steep slopes, rock fall, damage from sidecast waste, large boulders, cliffs
C2	Not rated	Unsuited	Unsuited	Unsuited	Poor - Good	Variable	Steep slopes, rock outcropping, damage from sidecast waste

* Samples tested by Deschutes National Forest Soil Materials Testing Lab.

TABLE OF INTERPRETATIONS - ENGINEERING

LANDTYPE NO.	UNIFIED CLASSIFICATION	MATERIALS SOURCE				ESTIMATION OF ROAD ROCK THICKNESS	CONSIDERATIONS FOR ROAD LOCATION AND DESIGN
		TOPSOIL	SAND/GRAVEL	CLAY	ROAD ROCK		
C3	Not rated	Unsuited	Unsuited	Unsuited	Unsuited	Variable	Steep slopes, rock outcropping, damage from sidecast waste
C5	Not rated	Unsuited	Unsuited	Unsuited	Unsuited - Good	Variable	Steep slopes, spring and seeps, damage from sidecast waste
C6	Not rated	Unsuited	Unsuited	Unsuited	Unsuited - Good	Variable	Steep slopes, spring and seep areas, damage from sidecast waste
C7	Not rated	Unsuited	Unsuited	Unsuited	Unsuited - Good	Variable	Steep slopes, springs and seep areas, damage from sidecast waste
C8	Not rated	Unsuited	Unsuited	Unsuited	Unsuited - Good	Variable	Steep slopes, spring and seeps, damage from sidecast waste
C9	Not rated	Unsuited	Unsuited	Unsuited	Poor - Good	Variable	Steep slopes, rock outcropping, springs and seeps, damage from sidecast waste
D1	SM **	Unsuited	Unsuited	Unsuited	Good	Thin	Mounds of rock outcrop, wind erosion
E1	SM, ML / SC, CL **	Unsuited	Unsuited	Unsuited	Unsuited	Thin - Thick	20-40" to cemented pan of sandstone, muddiness, clay shrink-swell potential
E2	ML, SM **	Suited	Unsuited	Unsuited	Unsuited - Good	Thin - Thick	Steep slopes locally, rock outcrop, dust
E3	ML, SM **	Suited	Unsuited	Unsuited	Unsuited - Good	Thin - Thick	Wind erosion, dust
E4	SM, ML, CL-ML / MH **	Unsuited	Unsuited	Suited	Unsuited	Thick	20-34" to cemented pan, clay shrink-swell potential, muddiness
E5	ML, SM / CH **	Unsuited	Unsuited	Unsuited	Unsuited	Thick	Muddiness, clay shrink-swell potential

** From USDA, Soil Conservation Service soil interpretation, OR-SOILS-1, forms.

TABLE OF INTERPRETATIONS - ENGINEERING

LANDTYPE NO.	UNIFIED CLASSIFICATION	MATERIALS SOURCE				ESTIMATION OF ROAD ROCK THICKNESS	CONSIDERATIONS FOR ROAD LOCATION AND DESIGN
		TOPSOIL	SAND/GRAVEL	CLAY	ROAD ROCK		
E6	ML, SM** / GM, GC, ML	Unsuited	Unsuited	Unsuited	Poor - Fair	Thin - Thick	20-40" to basalt, muddiness, clay shrink-swell potential
E7	SM, ML** / SC, CL	Unsuited	Unsuited	Unsuited	Unsuited	Thin - Thick	Rock outcrop, steep slopes, dissected slopes, poor alignment
E8	ML**	Unsuited	Unsuited	Unsuited	Unsuited	Thick	Shallow soils, muddiness
F1	SM, ML**	Suited	Unsuited	Unsuited	Unsuited - Good	Thin	Low strength, wind erosion, flooding
F2	SM** / GP, GM	Suited	Unsuited	Unsuited	Unsuited	Thin	-----
G1	ML** / CH, GC	Unsuited	Unsuited	Suited	Unsuited	Thick	Muddiness, shrink-swell, clays, steep slopes locally
G2	ML** / CH, GC	Unsuited	Unsuited	Suited	Unsuited	Thick	Muddiness, shrink-swell, clay, steep slopes locally
G3	ML** / CH, GC	Unsuited	Unsuited	Suited	Unsuited	Thick	Muddiness, steep slopes, shrink-swell, clays
G7	ML** / ML, SM	Unsuited	Unsuited	Unsuited	Unsuited	Thick	Steep slopes
H2	GM, ML**	Unsuited	Unsuited	Unsuited	Poor - Good	Thin - Thick	Shallow soils, rock outcrop, ditch erosion
H3	GM, ML**	Unsuited	Unsuited	Unsuited	Poor - Good	Thin - Thick	Shallow soils, steep slopes, rock outcrop
J0	Not rated	Unsuited	Unsuited	Unsuited	Good	Thin	Very shallow soils, rock outcrop, stoniness
J1	GM, GC**	Unsuited	Unsuited	Unsuited	Good	Very thin	Shallow soils, rock outcrop
J2	Not rated	Unsuited	Unsuited	Unsuited	Unsuited - Poor	Variable	Shallow soils, steep slopes, highly dissected slopes, poor alignment

TABLE OF INTERPRETATIONS - ENGINEERING

LANDTYPE NO.	UNIFIED CLASSIFICATION	MATERIALS SOURCE				ESTIMATION OF ROAD ROCK THICKNESS	CONSIDERATIONS FOR ROAD LOCATION AND DESIGN
		TOPSOIL	SAND/GRAVEL	CLAY	ROAD ROCK		
J3	GM, ML GM, CH	Unsuited	Unsuited	Unsuited	Unsuited	Thin - Thick	Muddiness, clay shrink-swell potential
J5	CL-ML, GM, CL GM, ML	Unsuited	Unsuited	Unsuited	Unsuited	Thin - Thick	Muddiness, steep slopes
J6	SM, GM, ML GM, GC	Unsuited	Unsuited	Unsuited	Poor - Fair	Thin	Steep slopes, rock outcrop
L1	SM, ML GM*, GC, SC	Unsuited	Unsuited	Unsuited	Unsuited	Thin - Thick	Steep slopes, rock outcrop, hummocky landscape
L2	SM, ML CL, SC*, GM-GC	Unsuited	Unsuited	Suited	Unsuited	Thick	Hummocky landscape, slump basins, seep areas, clay shrink-swell potential
L3	ML, CL CL, SC, GM-GC	Unsuited	Unsuited	Suited	Unsuited	Thick	Hummocky landscape, slump basins, seep areas, clay shrink-swell potential
L5	SM, ML CH, CL	Unsuited	Unsuited	Unsuited	Unsuited	Thick	Fill compacting difficulty
L6	SM, ML CL, SC, GM-GC*	Unsuited	Unsuited	Unsuited	Unsuited	Thick	Slump basins, seep areas, hummocky topography, clay shrink-swell potential
L7	CL, ML-CL CH, CL	Suited	Unsuited	Suited	Unsuited	Very thick	Seep areas, slump basins, muddiness, wet soils, clay shrink-swell potential
L8	ML, SM CL, SC*, GM-GC	Unsuited	Unsuited	Unsuited	Unsuited	Thick	Hummocky topography, seep areas, wet areas, clay shrink-swell potential
M1	Not rated	Suited	Unsuited	Suited	Unsuited	Thick	Wet soils, muddiness
M2	Not rated	Suited	Unsuited	Suited	Unsuited	Thick	Wet soils, muddiness
M3	Not rated	Suited	Unsuited	Suited	Unsuited	Thick	Muddiness, wet areas
M8	Not rated	Suited	Unsuited	Unsuited	Fair	Thick	Wet soils, muddiness

TABLE OF INTERPRETATIONS - ENGINEERING

LANDTYPE NO.	UNIFIED CLASSIFICATION	MATERIALS SOURCE				ESTIMATION OF ROAD ROCK THICKNESS	CONSIDERATIONS FOR ROAD LOCATION AND DESIGN
		TOPSOIL	SAND/GRAVEL	CLAY	ROAD ROCK		
N1	ML GMu, GC	Unsuited	Unsuited	Unsuited	Good	Thin	Steep slopes, shallow soils, rock outcrop
N2	ML GMu, GC	Unsuited	Unsuited	Unsuited	Good	Thin	Steep slopes, rock outcrop
N3	ML GMu, GC	Unsuited	Unsuited	Unsuited	Good	Thin	Springs and seep areas, rock outcrop
N4	GMu	Unsuited	Unsuited	Unsuited	Good	Thin	Springs and seeps, steep slopes
N5	GMu GMu, GC	Unsuited	Unsuited	Unsuited	Good	Thin	Steep slopes, shallow soils, rock outcrop
N6	GMu* GMu, GC	Unsuited	Unsuited	Unsuited	Good	Thin	Shallow soils
N7	GMu	Unsuited	Unsuited	Unsuited	Good	Thin	Shallow soils
N8	GMu	Unsuited	Unsuited	Unsuited	Good	Very thin	Shallow soils, rock outcrop
N9	GMu	Unsuited	Unsuited	Unsuited	Good	Very thin	Shallow soils, rock outcrop, steep slopes
P1	ML, SM SC, CL	Unsuited	Unsuited	Unsuited	Good	Thin - Thick	Fill compaction difficulty
P2	ML, SM SC, CL	Unsuited	Unsuited	Unsuited	Good	Thin - Thick	Fill compaction difficulty
P3	ML, SM SC, CL	Unsuited	Unsuited	Unsuited	Good	Thin - Thick	Wind erosion, shallow soils
P4	ML	Unsuited	Unsuited	Unsuited	Good	Thick	Shallow soils, seasonal wetness and muddiness, wind erosion
P5	GM*, SMu	Unsuited	Unsuited	Unsuited	Good	Thick	Shallow soils, rock outcrop, poorly defined runoff channels
P8	ML, SM SC, CL	Unsuited	Unsuited	Unsuited	Good	Thin - Thick	Shallow soils locally

TABLE OF INTERPRETATIONS - ENGINEERING

LANDTYPE NO.	UNIFIED CLASSIFICATION	MATERIALS SOURCE				ESTIMATION OF ROAD ROCK THICKNESS	CONSIDERATIONS FOR ROAD LOCATION AND DESIGN
		TOPSOIL	SAND/GRAVEL	CLAY	ROAD ROCK		
P9	ML*, SM ML, SM*	Suited	Unsuited	Unsuited	Good	Thin - Thick	Fill compaction difficulty
Q1	SMu, SMd*	Unsuited	Unsuited	Unsuited	Fair - Good	Thin	Shallow soils in areas
Q2	GMu, SMd GMu, SMu	Unsuited	Unsuited	Unsuited	Fair - Good	Thin	Steepness in areas, shallow soils locally
Q3	GMd, SMd	Unsuited	Unsuited	Unsuited	Fair - Good	Thin	Shallow soils, rock outcrop
Q4	GMd, SMd	Unsuited	Unsuited	Unsuited	Fair - Good	Very thin	Shallow soils, rock outcrop, steep slopes
Q7	GMd, SMd	Unsuited	Unsuited	Unsuited	Fair - Good	Thin	Shallow soils, rock outcrop
Q8	ML GMd, SMd	Unsuited	Unsuited	Unsuited	Fair - Good	Thin	Shallow soils in areas
Q9	ML GMu, SMd	Unsuited	Unsuited	Unsuited	Fair - Good	Thin	Steepness in areas
R1	ML, SM GMd, SMd	Unsuited	Unsuited	Unsuited	Fair	Thin	Steep slopes, rock outcrop
R2	ML, SM GMd*, SMd	Unsuited	Unsuited	Unsuited	Fair	Thin	-----
R3	ML, SM GMd, SMd	Unsuited	Unsuited	Unsuited	Fair	Thin	Seeps, steep slopes, rock outcrop
R4	SM, GM	Unsuited	Unsuited	Unsuited	Fair	Very thin	Steep slopes, shallow soils, rock outcrop
R5	SM, GM	Unsuited	Unsuited	Unsuited	Fair	Very thin	Rock outcrop, shallow soils
R6	ML, SM GMd*, SMd	Unsuited	Unsuited	Unsuited	Unsuited	Thin	-----
R7	ML, SM GMd, SMd	Unsuited	Unsuited	Unsuited	Fair	Thin	-----

TABLE OF INTERPRETATIONS - ENGINEERING

LANDTYPE NO.	UNIFIED CLASSIFICATION	MATERIALS SOURCE				ESTIMATION OF ROAD ROCK THICKNESS	CONSIDERATIONS FOR ROAD LOCATION AND DESIGN
		TOPSOIL	SAND/GRAVEL	CLAY	ROAD ROCK		
S1	Not rated	Unsuited	Unsuited	Unsuited	Good	Very thin	Rock outcrop, very shallow soils
T2	ML, SM / CL, CH, SC	Unsuited	Unsuited	Suited	Unsuited	Thick	Seeps, muddiness, clay shrink-swell potential, steep slopes locally
T3	ML, CL / CL, CH, SC	Unsuited	Unsuited	Suited	Unsuited	Thick	Seeps, steep slopes locally, muddiness, clay shrink-swell potential
T5	ML, MH / CH, CL	Unsuited	Unsuited	Suited	Unsuited	Thick	Clay shrink-swell potential, muddiness, steep slopes locally
T6	SM*, ML / CL, CH, SC	Unsuited	Unsuited	Suited	Unsuited	Thick	Seep areas, steep slopes locally, clay shrink-swell potential, muddiness
T7	ML, MH / CH, CL	Unsuited	Unsuited	Suited	Unsuited	Thick	Seeps, muddiness, clay shrink-swell potential
T8	SM, ML / CL, GH, SC	Unsuited	Unsuited	Suited	Unsuited	Thick	Seeps, steep slopes locally, clay shrink-swell potential, muddiness
U4	ML / CH, GC	Unsuited	Unsuited	Suited	Unsuited	Thin to Thick	Slump basins, seeps, clay shrink-swell potential
U5	ML / ML	Unsuited	Unsuited	Unsuited	Unsuited	Thick	Slump areas, seeps
V1	ML / SC, CL	Unsuited	Unsuited	Unsuited	Unsuited	Thick	Clay shrink-swell potential, steep slopes locally
V2	ML / GMu	Unsuited	Unsuited	Unsuited	Poor	Thin	Steep slopes, shallow soil locally
V3	GMu* / GMu	Unsuited	Unsuited	Unsuited	Poor	Thin	Steep slopes, shallow soils
V4	GMu	Unsuited	Unsuited	Unsuited	Poor	Very thin	Steep slopes, shallow soils, rock outcrop
V5	GMu		Unsuited	Unsuited	Poor	Very thin	Steep slopes, shallow soils, rock outcrop

TABLE OF INTERPRETATIONS - ENGINEERING

LANDTYPE NO.	UNIFIED CLASSIFICATION	MATERIALS SOURCE				ESTIMATION OF ROAD ROCK THICKNESS	CONSIDERATIONS FOR ROAD LOCATION AND DESIGN
		TOPSOIL	SAND/GRAVEL	CLAY	ROAD ROCK		
V6	ML GMu	Unsuited	Unsuited	Unsuited	Poor	Thin	Steep slopes
V7	GMu	Unsuited	Unsuited	Unsuited	Poor	Very thin	Rock outcrop, shallow soils
V8	GMu GMu, GC	Unsuited	Unsuited	Unsuited	Unsuited	Thin	Shallow soils locally
X3	ML CH, CL	Unsuited	Unsuited	Suited	Unsuited - Poor	Thick	Steep slopes, seeps
X6	ML, SM CL, CH	Unsuited	Unsuited	Unsuited	Fair - Good	Thin - Thick	Stony soils
X7	ML, SM CL, CH	Unsuited	Unsuited	Unsuited	Fair - Good	Thin - Thick	-----
X8	ML, ML-CL CH, CL	Unsuited	Unsuited	Unsuited	Fair - Good	Thick	Shallow soils, muddiness
X9	CL CH, CL	Unsuited	Unsuited	Suited	Fair - Good	Thick	Seasonally wet soils, muddiness, clay shrink-swell potential
Y1	ML, SM SM, SC, GM	Unsuited	Unsuited	Unsuited	Good	Thick	Shallow soils locally, wind erosion
Y2	SM, ML GM, SC, SMu	Unsuited	Unsuited	Unsuited	Good	Thin	Steep slopes, rock outcrop, damage from sidecast waste
Y3	ML, SM GM, SC, SMu	Unsuited	Unsuited	Unsuited	Good	Thin	Steep slopes, rock outcrop, shallow soils locally
Y4	GM, SC, SM	Unsuited	Unsuited	Unsuited	Good	Thin	Dissected slopes, shallow soils, steep slopes, rock outcrop
Y7	ML, SMu* SC, GM, SMu	Unsuited	Unsuited	Unsuited	Good	Thick - Very thick	Seasonally wet soils, muddiness
Y8	ML, SM ML	Unsuited	Unsuited	Unsuited	Good	Thick	Fill compaction problems
Y9	ML GM, SC, SMu	Unsuited	Unsuited	Unsuited	Good	Thin	Steep slopes, rock outcrop, shallow soils locally

TABLE OF INTERPRETATIONS - ENGINEERING (CONTINUED)

LANDTYPE NO.	ROAD CUTBANKS					STABILITY		
	POTENTIAL FOR CUTBANK + DITCH EROSION	POTENTIAL FOR CUTBANK SLOUGHING + RAVELING	ESTIMATION OF CUTBANK RATIO	SUITABILITY OF CUTBANK SEEDING	LIMITATIONS OF CUTBANK SEEDING	NATURAL STABILITY	NATURE OF MASS MOVEMENT	POSSIBLE STABILITY CHANGES FROM ROADBUILDING
A1	High	Low	Flat	Good	-----	Very stable	-----	Unchanged
A2	Moderate - High	Low	Flat	Fair - Good	South exposure	Very stable	-----	Unchanged
A4	Moderate - High	Low	Flat	Fair - Good	South exposure	Very stable	-----	Unchanged
B1	High	Moderate	Steep	Poor	Rock outcrop, shallow soils, south exposure	Stable	Rock failure	Increased
B4	High	Moderate	Steep	Poor	Shallow soils, rockiness, south exposure	Stable	Rock failure	Increased
B5	Low - High	Low	Steep	Poor	Shallow soils, rockiness, south exposure	Very stable	-----	Unchanged
B6	Low	Low	Moderate	Good	-----	Very stable	-----	Unchanged
B7	Low	Moderate	Moderate	Fair	South exposure, rockiness	Stable	Rock failure, small slumps	Increased
B8	Moderate	Moderate	Moderate	Fair	Droughty site, fertility, rockiness	Stable	Small slumps, bedrock failure	Increased
B9	Moderate	Moderate	Moderate	Fair	Fertility, rockiness	Stable	Bedrock failure, small slumps	Increased
C1	Low - High	High	Moderate - Flat	Poor	Low precipitation, stony soils	Stable	Rock failure, slumps	Increased

TABLE OF INTERPRETATIONS - ENGINEERING (CONTINUED)

LANDTYPE NO.	ROAD CUTBANKS					STABILITY		
	POTENTIAL FOR CUTBANK + DITCH EROSION	POTENTIAL FOR CUTBANK SLOUGHING + RAVELING	ESTIMATION OF CUTBANK RATIO	SUITABILITY OF CUTBANK SEEDING	LIMITATIONS OF CUTBANK SEEDING	NATURAL STABILITY	NATURE OF MASS MOVEMENT	POSSIBLE STABILITY CHANGES FROM ROADBUILDING
C2	Low - High	Moderate - High	Moderate - Flat	Poor - Good	Variable soils, fertility, rockiness, cold soils	Stable	Slumps, rock failures	Increased
C3	Low - High	Moderate - High	Moderate	Poor	Droughty site, rockiness, variable soils	Stable	Slumps, rock failures	Increased
C5	High	Low - Moderate	Moderate - Flat	Poor - Good	Rockiness, fertility, cold soil	Stable to Unstable	Slumps	Increased
C6	Low	Moderate - High	Moderate - Flat	Poor	Shallow soils, rockiness, south exposure	Stable to Moderately Stable	Slumps	Increased
C7	Moderate	Moderate	Moderate - Flat	Poor - Fair	South exposure, shallow soils	Stable to Unstable	Slumps	Increased
C8	High	Low - Moderate	Moderate - Flat	Fair - Good	Rock, shallow soils	Stable to Unstable	Slumps	Increased
C9	Moderate	Moderate	Moderate - Flat	Poor	Cold soils, fertility	Stable	Slumps, rock failure	Increased
D1	Low	Low	Moderate	Poor	Low precipitation, south exposure	Very stable	-----	Unchanged
E1	Low	Low	Moderate	Poor	Low precipitation, south exposure	Very stable	-----	Unchanged
E2	Moderate	Low	Moderate	Poor	Low precipitation, fertility	Very stable	-----	Unchanged
E3	Moderate	Low	Moderate	Poor	Low precipitation, south exposure	Very stable	-----	Unchanged

TABLE OF INTERPRETATIONS - ENGINEERING (CONTINUED)

LANDTYPE NO.	ROAD CUTBANKS					STABILITY		
	POTENTIAL FOR CUTBANK + DITCH EROSION	POTENTIAL FOR CUTBANK SLOUGHING + RAVELING	ESTIMATION OF CUTBANK RATIO	SUITABILITY OF CUTBANK SEEDING	LIMITATIONS OF CUTBANK SEEDING	NATURAL STABILITY	NATURE OF MASS MOVEMENT	POSSIBLE STABILITY CHANGES FROM ROADBUILDING
E4	Moderate	Low	Moderate	Poor	Low precipitation, south exposure	Very stable	-----	Unchanged
E5	Moderate - High	Low - Moderate	Moderate	Poor	Low precipitation, south exposure	Very stable	-----	Increased
E6	Low - Moderate	Low	Moderate	Poor	Low precipitation, south exposure	Very stable	-----	Unchanged
E7	Moderate	Moderate	Moderate	Poor	Low precipitation, south exposure	Very stable	-----	Unchanged
E8	Moderate	Low	Steep	Poor	Low precipitation, south exposure	Very stable	-----	Unchanged
F1	Low	Low	Flat	Poor	Low precipitation, south exposure	Very stable	-----	Unchanged
F2	Low	Low	Moderate	Poor	Low precipitation, south exposure	Very stable	-----	Unchanged
G1	Moderate - High	Low	Moderate	Fair	Low precipitation	Very stable	-----	Unchanged
G2	Moderate - High	Low	Moderate	Poor	Low precipitation, south exposure	Very stable	-----	Unchanged
G3	Moderate - High	High	Moderate	Poor	Low precipitation, south exposure	Stable	Slumps	Increased
G7	High	High	Moderate	Fair	Low precipitation	Stable	Slumps	Increased

TABLE OF INTERPRETATIONS - ENGINEERING (CONTINUED)

LANDTYPE NO.	ROAD CUTBANKS					STABILITY		
	POTENTIAL FOR CUTBANK + DITCH EROSION	POTENTIAL FOR CUTBANK SLOUGHING + RAVELING	ESTIMATION OF CUTBANK RATIO	SUITABILITY OF CUTBANK SEEDING	LIMITATIONS OF CUTBANK SEEDING	NATURAL STABILITY	NATURE OF MASS MOVEMENT	POSSIBLE STABILITY CHANGES FROM ROADBUILDING
H2	High	Low	Steep	Poor	Low precipitation, shallow soils, south exposure	Very stable	-----	Unchanged
H3	High	Low	Steep	Poor	Low precipitation, shallow soils, south exposure	Very stable	-----	Increased
J0	Low - High	Low	Steep	Poor	Exposed rock, very shallow soils, low precipitation	Very stable	-----	Unchanged
J1	Low - Moderate	Low	Steep	Poor	Low precipitation, shallow soils, rockiness, south exposure	Very stable	-----	Unchanged
J2	Low - High	High	Steep - Moderate	Poor	Low precipitation, south exposure, shallow soils, rock	Stable	Slumps, small rock slide	Increased
J3	Moderate	Low	Moderate	Poor	Low precipitation, south exposure	Very stable	-----	Unchanged
J5	High	Moderate	Moderate	Poor	Low precipitation, south exposure, gravelly soils	Stable	Slumps	Increased
J6	High	High	Moderate	Poor	Low precipitation, south exposure	Stable	Slumps	Increased
L1	Low	Moderate	Moderate	Good	Gravelly soils	Stable to Moderately stable	Slumps	Increased
L2	Moderate	High	Flat	Good	-----	Moderately stable to Unstable	Slumps	Increased

TABLE OF INTERPRETATIONS - ENGINEERING (CONTINUED)

LANDTYPE NO.	ROAD CUTBANKS					STABILITY		
	POTENTIAL FOR CUTBANK + DITCH EROSION	POTENTIAL FOR CUTBANK SLOUGHING + RAVELING	ESTIMATION OF CUTBANK RATIO	SUITABILITY OF CUTBANK SEEDING	LIMITATIONS OF CUTBANK SEEDING	NATURAL STABILITY	NATURE OF MASS MOVEMENT	POSSIBLE STABILITY CHANGES FROM ROADBUILDING
L3	Moderate	High	Flat	Fair	South exposure	Moderately stable	Slumps	Increased
L5	Low	Low	Flat	Poor	Fertility, south exposure	Very stable	-----	Unchanged
L6	Moderate	High	Flat	Poor - Fair	Fertility	Moderately stable to Unstable	Slumps	Increased
L7	High	High	Flat	Fair	South exposures, fertility, shrink-swell clays	Very stable	-----	Unchanged
L8	Moderate	High	Flat	Fair	South exposure	Moderately stable	Slumps	Increased
M1	Moderate	Low	Flat	Good	Cold soils	Very stable	-----	Unchanged
M2.	Moderate	Low	Flat	Good	Wetness, cold soils	Very stable	-----	Increased
M3	Moderate	Low	Flat	Good	-----	Very stable	-----	Unchanged
M8	Moderate	Low	Flat	Good	Cold soils	Very stable	-----	Unchanged
N1	Moderate	Moderate	Steep - Moderate	Poor - Fair	Rockiness, south exposures	Stable	Slumps and bedrock failures along interflow zones	Increased

TABLE OF INTERPRETATIONS - ENGINEERING (CONTINUED)

LANDTYPE NO.	ROAD CUTBANKS					STABILITY		
	POTENTIAL FOR CUTBANK + DITCH EROSION	POTENTIAL FOR CUTBANK SLOUGHING + RAVELING	ESTIMATION OF CUTBANK RATIO	SUITABILITY OF CUTBANK SEEDING	LIMITATIONS OF CUTBANK SEEDING	NATURAL STABILITY	NATURE OF MASS MOVEMENT	POSSIBLE STABILITY CHANGES FROM ROADBUILDING
N2	High	Moderate	Moderate	Fair	Rockiness, cold soils	Stable	Slumps and bedrock failures along interflow zones	Increased
N3	Moderate	Low	Steep - Moderate	Good	Rockiness	Very stable	-----	Unchanged
N4	Low	Moderate	Steep	Poor - Fair	Rockiness, shallow soils, south exposure	Very stable to Stable	Slumps and bedrock failures along interflow zones	Unchanged
N5	Moderate	Moderate	Steep - Moderate	Poor - Fair	Rockiness, shallow soils, south exposure	Stable	Small slumps and bedrock failures along interflow zones	Unchanged
N6	Low	Low	Steep - Moderate	Poor - Fair	Rockiness, shallow soils, south exposure	Very stable	-----	Unchanged
N7	Low	Low	Steep	Poor - Fair	Rockiness, shallow soils, south exposure	Very stable	-----	Unchanged
N8	Low	Low	Steep	Poor	Shallow soils, rockiness, south exposure	Very stable	-----	Unchanged
N9	Low	Moderate	Steep	Poor	Rockiness, shallow soils, south exposure	Very stable to Stable	Slumps and bedrock failures along interflow zones	Increased

TABLE OF INTERPRETATIONS - ENGINEERING (CONTINUED)

LANDTYPE NO.	ROAD CUTBANKS					STABILITY		
	POTENTIAL FOR CUTBANK + DITCH EROSION	POTENTIAL FOR CUTBANK SLOUGHING + RAVELING	ESTIMATION OF CUTBANK RATIO	SUITABILITY OF CUTBANK SEEDING	LIMITATIONS OF CUTBANK SEEDING	NATURAL STABILITY	NATURE OF MASS MOVEMENT	POSSIBLE STABILITY CHANGES FROM ROADBUILDING
P1	Low	Low	Moderate	Poor - Fair	Fertility	Very stable	-----	Unchanged
P2	Moderate	Moderate	Moderate	Poor - Fair	Fertility	Very stable	-----	Unchanged
P3	Moderate	Low	Moderate	Fair	South exposure, fertility	Very stable	-----	Unchanged
P4	High	Low	Steep	Poor	Shallow soils, rockiness, south exposure	Very stable	-----	Unchanged
P5	Low	Low	Steep	Poor	Shallow soils, rockiness, south exposure	Very stable	-----	Unchanged
P8	High	Low	Moderate	Poor	South exposure, rockiness	Very stable	-----	Unchanged
P9	Low - Moderate	Low	Moderate	Good	Fertility, cold soils	Very stable	-----	Unchanged
Q1	Low	Low	Steep	Poor - Fair	Rockiness, shallow soils, south exposure	Very stable	-----	Unchanged
Q2	Moderate	Low - Moderate	Steep - Moderate	Poor - Fair	Shallow soils in areas, south exposure	Very stable to Stable	Small slumps	Unchanged
Q3	Low	Low	Steep	Poor	Shallow soils, rockiness, south exposure	Very stable	-----	Unchanged
Q4	Low	Moderate	Steep	Poor	Shallow soils, rockiness, south exposure	Stable	Small road-cut slumps	Increased
Q7	Low	Low	Steep	Poor	Very shallow soils, rockiness, south exposure	Very stable	-----	Unchanged

TABLE OF INTERPRETATIONS - ENGINEERING (CONTINUED)

LANDTYPE NO.	ROAD CUTBANKS					STABILITY		
	POTENTIAL FOR CUTBANK + DITCH EROSION	POTENTIAL FOR CUTBANK SLOUGHING + RAVELING	ESTIMATION OF CUTBANK RATIO	SUITABILITY OF CUTBANK SEEDING	LIMITATIONS OF CUTBANK SEEDING	NATURAL STABILITY	NATURE OF MASS MOVEMENT	POSSIBLE STABILITY CHANGES FROM ROADBUILDING
Q8	Moderate	Low	Steep - Moderate	Poor - Fair	Shallow soils in areas, rockiness	Very stable	-----	Increased
Q9	Moderate	Low - Moderate	Moderate	Good	-----	Very stable to Stable	Small slumps	Unchanged
R1	Moderate	Low	Moderate	Poor - Fair	South exposure, fertility	Stable	Slumps	Increased
R2	Moderate	Low	Moderate	Fair	South exposure, fertility	Very stable	-----	Unchanged
R3	Moderate	Low	Moderate	Poor - Fair	Cold soils, fertility	Stable to Moderately stable	Slumps	Increased
R4	Moderate	Low	Steep	Poor	Shallow soils, south exposure, rockiness	Very stable	-----	Unchanged
R5	Moderate	Low	Steep	Poor	Shallow soils, south exposure, rockiness	Very stable	-----	Unchanged
R6	Moderate	Low	Moderate	Poor - Fair	Cold soils, fertility	Stable	Slumps	Increased
R7	Moderate	Low	Moderate	Poor - Fair	Cold soils, fertility	Very stable	-----	Unchanged
S1	Low	Low	Steep	Poor	Rockiness	Very stable	-----	Unchanged
T2	High	High	Flat	Good	Fertility	Moderately stable	Slumps	Increased

TABLE OF INTERPRETATIONS - ENGINEERING (CONTINUED)

LANDTYPE NO.	ROAD CUTBANKS					STABILITY		
	POTENTIAL FOR CUTBANK + DITCH EROSION	POTENTIAL FOR CUTBANK SLOUGHING + RAVELING	ESTIMATION OF CUTBANK RATIO	SUITABILITY OF CUTBANK SEEDING	LIMITATIONS OF CUTBANK SEEDING	NATURAL STABILITY	NATURE OF MASS MOVEMENT	POSSIBLE STABILITY CHANGES FROM ROADBUILDING
T3	Moderate	Moderate	Flat	Fair	South exposure, fertility	Stable to Moderately stable	Slumps, deep-seated failures	Increased
T5	High	High	Flat	Poor	South exposure, low precipitation in shrink-swell clays	Very stable	-----	Unchanged
T6	Low	High	Flat	Fair	Fertility	Moderately stable	Slumps	Increased
T7	High	High	Flat	Fair	South exposure, shrink-swell clays, fertility	Stable	Landflow	Unchanged
T8	High	High	Flat	Fair	South exposure, fertility	Moderately stable	Slumps	Increased
U4	Moderate	Moderate	Moderate	Good	-----	Stable to Moderately stable	Slumps	Increased
U5	Moderate	Moderate - High	Moderate	Good	-----	Very stable	-----	Unchanged
V1	Moderate	Moderate	Moderate	Poor	Low precipitation, south exposure	Very stable	-----	Unchanged
V2	Moderate	High	Moderate	Fair	South exposure	Very stable	Bedrock failures on adverse bedding planes	Increased

TABLE OF INTERPRETATIONS - ENGINEERING (CONTINUED)

LANDTYPE NO.	ROAD CUTBANKS					STABILITY		
	POTENTIAL FOR CUTBANK + DITCH EROSION	POTENTIAL FOR CUTBANK SLOUGHING + RAVELING	ESTIMATION OF CUTBANK RATIO	SUITABILITY OF CUTBANK SEEDING	LIMITATIONS OF CUTBANK SEEDING	NATURAL STABILITY	NATURE OF MASS MOVEMENT	POSSIBLE STABILITY CHANGES FROM ROADBUILDING
V3	Moderate	High	Steep - Moderate	Poor - Fair	Shallow soil, rockiness, south exposure	Very stable	Bedrock failures may occur on adverse bedding planes	Increased
V4	Low	High	Steep	Poor - Fair	Shallow soil, rockiness, south exposure	Very stable	Bedrock failures may occur on adverse bedding planes	Increased
V5	Low	High	Steep	Poor - Fair	Shallow soil, rockiness, south exposure	Very stable	Bedrock failures may occur where bedrock has adverse bedding planes	Unchanged
V6	High	High	Moderate	Good	Cold soils, fertility	Very stable	Bedrock failures may occur where bedrock has adverse bedding planes	Increased
V7	Low	Moderate	Steep	Poor	Shallow soils, rockiness, south exposure	Very stable	Bedrock failures may occur where bedrock has adverse bedding plane	Increased

TABLE OF INTERPRETATIONS - ENGINEERING (CONTINUED)

LANDTYPE NO.	ROAD CUTBANKS					STABILITY		
	POTENTIAL FOR CUTBANK + DITCH EROSION	POTENTIAL FOR CUTBANK SLOUGHING + RAVELING	ESTIMATION OF CUTBANK RATIO	SUITABILITY OF CUTBANK SEEDING	LIMITATIONS OF CUTBANK SEEDING	NATURAL STABILITY	NATURE OF MASS MOVEMENT	POSSIBLE STABILITY CHANGES FROM ROADBUILDING
V8	Low	Moderate	Steep - Moderate	Fair	Shallow soil locally, south exposure	Very stable	-----	Unchanged
X3	Moderate	Moderate	Moderate - Flat	Poor	Low precipitation, fertility, shrink-swell clay	Very stable	-----	Unchanged
X6	Low	Low	Moderate	Fair	Fertility	Very stable	-----	Unchanged
X7	Low	Moderate	Moderate	Fair	Low precipitation, rockiness	Very stable	-----	Unchanged
X8	High	Low	Steep	Poor	Shallow soils, low precipitation, shrink-swell clays	Very stable	-----	Unchanged
X9	High	Low	Moderate	Poor	-----	Very stable	-----	Unchanged
Y1	High	Low	Moderate	Poor	Cold soil, low fertility	Very stable	-----	Unchanged
Y2	High	Moderate	Moderate - Flat	Fair	Cold soil, low fertility	Stable	Small slumps	Increased
Y3	High	Moderate	Moderate	Fair	South exposure, rockiness	Stable	Slumps	Increased
Y4	Low	Low	Steep - Moderate	Poor	Shallow soils, rockiness, south exposure	Stable	Slumps	Increased
Y7	Moderate	Low	Moderate	Fair	Cold soil, fertility	Very stable	-----	Unchanged
Y8	Moderate - High	Low	Moderate	Poor	Cold soil, fertility	Very stable	-----	Unchanged
Y9	Moderate	Moderate	Moderate	Fair	South exposure, rockiness	Stable	Slumps	Increased

TABLE OF INTERPRETATIONS - TIMBER

Interpretations for timber management are of two types. One type includes some interpretations that directly affect timber management such as "potentials for regeneration". The other type indicates the effect on soils and other resources from timber harvest activities.

Susceptibility to Rhizomatous Grass Competition

This interpretation indicates the susceptibility of each landtype to pinegrass or elk sedge competition following timber harvest operations. These ratings are based on soil characteristics, drainage, elevation, climate, topography position, field observations, and plant community types.

Low - Factors do not encourage rhizomatous species establishment and growth. Little or no rhizomatous competition occurs.

Moderate - Factors are moderately favorable for rhizomatous species establishment and growth. Rhizomatous competition is moderate.

High - Factors are highly favorable for rhizomatous species establishment and growth. Rhizomatous competition occurs rapidly.

Potentials for Regeneration

This interpretation indicates the potential for natural and artificial regeneration separately.

Natural Regeneration - Having seedlings naturally established five years after regeneration harvest.

Artificial Regeneration - Having seedlings established by planting.

This interpretation has two columns for each category above.

Tree Species - Tree consideration for regeneration potential on landtype. PP = ponderosa pine, LP = lodgepole pine, WL = western larch, DF = Douglas-fir, WF = white (grand) fir, AF = alpine fir, ES = Engelmann spruce.

Rating - The potential of the tree species in the row of the column to the left for regeneration.

Very low - Potential for regeneration is very limited and will take means above normal climatic conditions or practices to have success.

Low - Probability of species success is very limited. Careful regeneration practices should be implemented. Reseeding or replanting may be required throughout the area.

Moderate - Obtaining satisfactory stocking level will often be difficult. Usually regeneration is spotty. Planting to fill in openings can be expected and often replanting will be necessary.

High - Regeneration to obtain good stocking levels will have high probability.

Limitations to Regeneration

This indicates the major soil limitations to regeneration of planted stock and naturals.

Considerations for Tree Harvest

This identifies soil characteristics to be considered in timber sale design. These may be in the nature of limitations to or anticipated impacts resulting from tree harvest.

TABLE OF INTERPRETATIONS - TIMBER

LANDTYPE NO.	SUSCEPTIBILITY TO RHIZOMATOUS GRASS COMPETITION	POTENTIALS FOR REGENERATION 1/ NATURAL TREE SPECIES	NATURAL RATING	ARTIFICIAL TREE SPECIES	ARTIFICIAL RATING	LIMITATIONS FOR REGENERATION	CONSIDERATIONS FOR TREE HARVEST
A1	Low	N/A	N/A	N/A	N/A	Meadow sites	Non-forest site
A2	Low	N/A	N/A	N/A	N/A	Meadow sites	Non-forest site
A4	Low	N/A	N/A	N/A	N/A	Meadow sites	Non-forest site
B1	Low	PP on PP sites	Very low	PP on PP sites	Very low	Non-forest to non-commercial forest sites because of shallow, droughty soils	Steep slopes, shallow soils, highly dissected slopes, rock outcrop, cliffs
B4	Low	PP on PP sites	Very low	PP on PP sites	Very low	Non-forest to non-commercial forest sites because of shallow, droughty soils	Steep slopes, shallow soils, rock outcrop, cliffs
B5	Low	PP on PP sites	Very low	PP on PP sites	Very low	Non-forest to non-commercial forest sites because of shallow, droughty soils	Gentle slopes, shallow soils, rock outcrop
B6	High	PP DF, WF	Moderate to High Low to Moderate	PP, DF WF, WL, LP	High Low to Moderate	Exposed clayey soils and south aspect will have lowest site potential	Gentle slopes
B7	Low to High	PP DF	Low to Moderate Low	PP DF	High Low to Moderate	Droughty sites, cobbly soils, steep slopes 2/	Steep slopes, areas of shallow soils, and rock outcrops
B8	High	PP DF, WF	Moderate to High Low to Moderate	PP, DF WF, WL, LP	High Moderate	Steep slopes, locally cobbly soils, shorten planting season due to south aspects	Steep slopes, areas of shallow soils, and rock outcrops
B9	High	PP DF, WF	Low to High Low to Moderate	PP DF WF, WL, LP	Low to High Moderate to High Moderate	Cobbly soils, steep slopes, cold soils locally	Steep slopes, shallow soils in areas, ravelly soils in areas
C1	N/A	N/A	N/A	N/A	N/A	Non-forest site because of low precipitation	Non-forest site, steep slopes, rock outcrops, talus slopes

1/ Adapted from Hall, 1973, pp. 58.

2/ Steep slopes restrict mechanical site preparation and tree planting.

TABLE OF INTERPRETATIONS - TIMBER

LANDTYPE NO.	SUSCEPTIBILITY TO RHIZOMATOUS GRASS COMPETITION	POTENTIALS FOR REGENERATION				LIMITATIONS FOR REGENERATION	CONSIDERATIONS FOR TREE HARVEST
		NATURAL		ARTIFICIAL			
		TREE SPECIES	RATING	TREE SPECIES	RATING		
C2	High	PP DF WF, LL, LP	Low Low to Moderate Moderate to High	PP	High	Steep slopes, variable soils, stony soils, locally talus	Steep slopes, rock outcrop, cliffs, talus, wet areas
C3	Low to High	PP DF	Low to Moderate Low	DF	Low to Moderate	Steep slopes, droughty sites, stony soils, variable soils, talus locally	Steep slopes, rock outcrop, cliffs, talus
C5	Low	WF WL, LP	Moderate to High High	LP, DF, WL WF PP, ES, AF	High Moderate Low	Steep slopes, variable soils with volcanic ash surfaces, talus locally, cold soils	Steep slopes, rock outcrop, talus
C6	Low	PP on PP sites	Very low to low	PP on PP sites	Very low to Moderate	Non-forest to non-commercial forest sites because of shallow, droughty soils, talus locally	Non-forest to non-commercial forest sites, shallow soils, rock outcrop, talus
C7	Low	PP DF	Low Very low to low	PP DF	High Very low to low	Steep slopes, short planting season due to droughtiness, talus locally	Steep slopes, rock outcrop, talus
C8	High	PP DF, WF,	High Moderate	PP WF, WL	High Low to Moderate	Steep slopes, variable soils with volcanic ash surfaces, talus locally	Steep slopes, rock outcrop, talus
C9	Low	WF AF, ES LP	Low to High Low to High Moderate to High	LP WF ES AF	High Low to Moderate Low to Moderate Low	Steep slopes, variable soils with volcanic ash surfaces, stony soils, talus locally, cold soils	Steep slopes, rock outcrop, cliffs, talus, wet areas
D1	N/A	N/A	N/A	N/A	N/A	Non-forest site because of low precipitation	Non-forest site
E1	N/A	N/A	N/A	N/A	N/A	Non-forest site because of low precipitation	Non-forest site
E2	N/A	N/A	N/A	N/A	N/A	Non-forest site because of low precipitation	Non-forest site
E3	N/A	N/A	N/A	N/A	N/A	Non-forest site because of low precipitation	Non-forest site

TABLE OF INTERPRETATIONS - TIMBER

LANDTYPE NO.	SUSCEPTIBILITY TO RHIZOMATOUS GRASS COMPETITION	POTENTIALS FOR REGENERATION				LIMITATIONS FOR REGENERATION	CONSIDERATIONS FOR TREE HARVEST
		NATURAL		ARTIFICIAL			
		TREE SPECIES	RATING	TREE SPECIES	RATING		
E4	N/A	N/A	N/A	N/A	N/A	Non-forest site because of low precipitation	Non-forest site
E5	N/A	N/A	N/A	N/A	N/A	Non-forest site because of low precipitation	Non-forest site
E6	N/A	N/A	N/A	N/A	N/A	Non-forest site because of low precipitation	Non-forest site
E7	N/A	N/A	N/A	N/A	N/A	Non-forest site because of low precipitation	Non-forest site
E8	N/A	N/A	N/A	N/A	N/A	Non-forest site because of low precipitation	Non-forest site
F1	N/A	N/A	N/A	N/A	N/A	Non-forest site because of low precipitation	Non-forest site
F2	N/A	N/A	N/A	N/A	N/A	Non-forest site because of low precipitation	Non-forest site
G1	N/A	N/A	N/A	N/A	N/A	Non-forest site because of low precipitation	Non-forest site
G2	N/A	N/A	N/A	N/A	N/A	Non-forest site because of low precipitation	Non-forest site
G3	N/A	N/A	N/A	N/A	N/A	Non-forest site because of low precipitation	Non-forest site
G7	N/A	N/A	N/A	N/A	N/A	Non-forest site because of low precipitation	Non-forest site
H2	N/A	N/A	N/A	N/A	N/A	Non-forest site because of low precipitation	Non-forest site
H3	N/A	N/A	N/A	N/A	N/A	Non-forest site because of low precipitation	Non-forest site
J0	N/A	N/A	N/A	N/A	N/A	Non-forest site because of low precipitation	Non-forest site
J1	N/A	N/A	N/A	N/A	N/A	Non-forest site because of low precipitation	Non-forest site

TABLE OF INTERPRETATIONS - TIMBER

LANDTYPE NO.	SUSCEPTIBILITY TO RHIZOMATOUS GRASS COMPETITION	POTENTIALS FOR REGENERATION				LIMITATIONS FOR REGENERATION	CONSIDERATIONS FOR TREE HARVEST
		NATURAL		ARTIFICIAL			
		TREE SPECIES	RATING	TREE SPECIES	RATING		
J2	N/A	N/A	N/A	N/A	N/A	Non-forest site because of low precipitation	Non-forest site
J3	N/A	N/A	N/A	N/A	N/A	Non-forest site because of low precipitation	Non-forest site
J5	N/A	N/A	N/A	N/A	N/A	Non-forest site because of low precipitation	Non-forest site
J6	N/A	N/A	N/A	N/A	N/A	Non-forest site because of low precipitation	Non-forest site
L1	High	PP DF, WF,	Moderate to High Low to Moderate	PP DF WF, WL, LP	High Moderate to High Low to Moderate	Steep slopes, very cobbly soils	Short steep slopes
L2	High	PP DF, WF	High Moderate	PP WF, WL, LP	High Moderate	Steep slopes and cobbly soils locally	Hummocky and benchy slopes, slump areas, wet areas
L3	Low to High	PP DF WF	Low to Moderate Low Very low to low	PP DF WF	High Low to Moderate Very low to low	Steep slopes and cobbly soils locally, shortened planting season due to south aspects	Hummocky and benchy slopes, slump areas
L5	Low to Moderate	LP WF	Moderate to High Low to Moderate	LP, WL DF WF, PP	High Moderate Low	Cold soils, frost pocket	Gentle slopes
L6	Low to Moderate	WF WL, LP	Moderate to High High	LP, DF, WL WF PP, ES, AF	High Moderate Low	Cold soils, steep slopes locally	Hummocky and benchy slopes, wet areas, slump areas
L7	Low	PP DF	Low to High Low to Moderate	PP DF	High Moderate	Clayey soils, seasonally wet saturated soils, puddling and compaction of soil	Soils rut easily during wet periods, wet areas, soils moderately well drained
L8	High	PP DF, WF	Moderate Low	PP, DF WF, WL, LP	High Moderate	Steep slopes and cobbly soils locally, shortened planting season due to south aspects	Hummocky and benchy slopes, slump areas

TABLE OF INTERPRETATIONS - TIMBER

LANDTYPE NO.	SUSCEPTIBILITY TO RHIZOMATOUS GRASS COMPETITION	POTENTIALS FOR REGENERATION				LIMITATIONS FOR REGENERATION	CONSIDERATIONS FOR TREE HARVEST
		NATURAL		ARTIFICIAL			
		TREE SPECIES	RATING	TREE SPECIES	RATING		
M1	N/A	N/A	N/A	N/A	N/A	Non-forest site due to seasonally saturated soils	Non-forest sites
M2	N/A	N/A	N/A	N/A	N/A	Non-forest site due to seasonally saturated soils	Non-forest sites
M3	N/A	N/A	N/A	N/A	N/A	Non-forest site due to seasonally saturated soils	Non-forest sites
M8	N/A	N/A	N/A	N/A	N/A	Non-forest site due to seasonally saturated soils	Non-forest sites
N1	High	PP DF, WF	Moderate to High Low to Moderate	PP DF WF, WL	High Moderate to High Low to Moderate	Steep slopes, cobbly soils locally	Steep slopes, areas of shallow soils
N2	Low	WF WL, LP	Moderate to High High	LP, DF, WL WF PP, ES, AF	High Moderate Low	Steep slopes, cold soils	Steep slopes, areas of shallow soils
N3	High	PP DF, WF	Moderate to High Low to Moderate	PP DF WF, WL	High Moderate to High Low to Moderate	Cobbly soils locally, shorter planting season on south slopes	Gentle slopes, areas of shallow soils
N4	Low	PP on PP sites	Very low to Low	PP on PP sites	Very low to Low	Non-forest to non-commercial forest sites because of shallow, droughty soils	Non-forest to non-commercial forest sites, steep slopes, shallow soils, fragile soil-vegetation site
N5	Low	PP DF	Low Very low to Low	PP DF	Moderate to High N/A to Low	Areas of shallow and droughty soils, cobbly soils locally	Steep slopes, areas of shallow soils, areas of non-commercial forest sites
N6	Low to High	PP DF	Low to Moderate Very low to Low	PP DF	Very low to Low Very low to Low	Shallow and cobbly soils locally, shortened planting season due to south aspect	Gentle slopes, areas of shallow soils with fragile soil-vegetation sites and non-commercial forest
N7	Low	PP on PP sites	Very low to Low	PP on PP sites	Very low to Low	Non-forest to non-commercial forest sites because of shallow, droughty soils	Non-forest to non-commercial forest sites, gentle slopes, shallow soils, fragile soil-vegetation sites

TABLE OF INTERPRETATIONS - TIMBER

LANDTYPE NO.	SUSCEPTIBILITY TO RHIZOMATOUS GRASS COMPETITION	POTENTIALS FOR REGENERATION				LIMITATIONS FOR REGENERATION	CONSIDERATIONS FOR TREE HARVEST
		NATURAL		ARTIFICIAL			
		TREE SPECIES	RATING	TREE SPECIES	RATING		
N8	N/A	N/A	N/A	N/A	N/A	Non-forest site due to very shallow, droughty soils	Non-forest sites, gentle slopes, fragile soil-vegetation site, shallow soils
N9	N/A	N/A	N/A	N/A	N/A	Non-forest site due to very shallow, droughty soils	Non-forest sites, shallow soils, steep slopes, fragile soil-vegetation site
P1	Low to Moderate	LP WF	Moderate to High Low to Moderate	LP DF WF, PP	High Moderate Low	Cold soils, frost pockets	Gentle slopes
P2	High	PP DF, WF	High Low	PP, DF WF, WL, LP	High Moderate	Steep slopes locally	Gentle to moderately steep slopes
P3	Low to High	PP DF	Low Very low to Low	PP DF	High Very low to Low	Shorter planting season on south aspects, shallow, droughty soils locally	Gentle slopes, high runoff and gully erosion potential on intermittent stream terraces
P4	Low	PP on PP sites	Very low to Low	PP on PP sites	Very low to Low	Non-forest to non-commercial forest site due to shallow, droughty soils	Non-forest to non-commercial forest sites, fragile soil-vegetation site, soil ruts easily during wet season
P5	N/A	N/A	N/A	N/A	N/A	Non-forest sites due to shallow, droughty soils	Non-forest site, fragile soil-vegetation site, shallow soils
P8	Low to High	PP DF	Low to Moderate Very low to Low	PP DF	High Very low to Low	Shorter planting season on south aspects, shallow and cobbly soils locally	Gentle slopes, areas of shallow soils
P9	Low to Moderate	WF WL, LP	Low to High Moderate to High	LP, WL, DF WF	High Moderate	Cold soils	Gentle slopes
Q1	Low	PP DF	Low to Moderate Very low to Low	PP DF	High Very low to Low	Shorter planting season on south aspects, shallow and cobbly soils locally	Gentle slopes, areas of shallow soils
Q2	Low	PP DF	Low to Moderate Very low to Low	PP DF	High Very low to Low	Shallow and cobbly soils locally, shortened planting season due to south aspects	Areas of steep slopes and shallow soils
Q3	N/A	PP on PP sites	Very low	PP on PP sites	Low	Non-forest to non-commercial forest sites due to shallow, droughty soils	Non-forest to non-commercial forest sites, shallow soils, gentle slopes, fragile soil-vegetation site

TABLE OF INTERPRETATIONS - TIMBER

LANDTYPE NO.	SUSCEPTIBILITY TO RHIZOMATOUS GRASS COMPETITION	POTENTIALS FOR REGENERATION				LIMITATIONS FOR REGENERATION	CONSIDERATIONS FOR TREE HARVEST
		NATURAL		ARTIFICIAL			
		TREE SPECIES	RATING	TREE SPECIES	RATING		
Q4	N/A	PP on PP sites	Very Low	PP on PP sites	Low	Non-forest to non-commercial forest sites due to shallow, droughty soils	Non-forest to non-commercial forest sites, steep slopes, shallow soils, fragile soil-vegetation site
Q7	N/A	N/A	N/A	N/A	N/A	Non-forest soils because of very shallow and droughty soils	Non-forest sites, shallow soils, gentle slopes, fragile soil-vegetation site
Q8	High	PP DF, WF	Moderate to High Low to Moderate	PP DF WF, WL	High Moderate Low	Shorter planting season on south aspects, cobbly soils locally	Gentle slopes, areas of shallow soils
Q9	High	PP DF, WF	Moderate to High Low to Moderate	PP DF WF, WL	High Moderate to High Low to Moderate	Steep slopes and cobbly soils locally, shorter planting season on south aspects	Steep slopes in areas, benchy slopes
R1	High	PP DF, WF	Moderate Low	PP, DF WF, WL, LP	High Moderate	Steep slopes, cobbly soils, shortened planting season due to south aspects	Steep slopes, rock outcrop
R2	High	PP DF, WF	Moderate Low	PP, DF WF, WL, LP	High Moderate	Cobbly soils, shortened planting season due to south aspects	Gentle slopes
R3	Low to Moderate	WF WL, LP	Moderate to High High	LP, DF, WL WF PP, ES, AF	High Moderate Low	Cold soils, cobbly soils locally, steep slopes	Gentle slopes
R4	N/A	N/A	N/A	N/A	N/A	Non-forest sites due to shallow, droughty soils	Steep slopes, shallow soil, fragile soil-vegetation site
R5	N/A	N/A	N/A	N/A	N/A	Non-forest sites due to shallow, droughty soils	Gentle slopes, shallow soils, fragile soil-vegetation site
R6	Low to Moderate	WF WL, LP	Moderate to High High	LP, DF, WL WF PP, ES, AF	High Moderate Low	Cold soils, frost pockets, cobbly soils locally	Gentle slopes, wet areas
R7	Low to Moderate	LP WF	Moderate to High Low to Moderate	LP, WL DF WF, PP	High Moderate Low	Cold soils, frost pockets, cobbly soils locally	Gentle slopes
S1	N/A	N/A	N/A	N/A	N/A	Extremely shallow soils and exposed bedrock	Non-forest site, gentle slopes, rock at soil surface

TABLE OF INTERPRETATIONS - TIMBER

LANDTYPE NO.	SUSCEPTIBILITY TO RHIZOMATOUS GRASS COMPETITION	POTENTIALS FOR REGENERATION				LIMITATIONS FOR REGENERATION	CONSIDERATIONS FOR TREE HARVEST
		NATURAL		ARTIFICIAL			
		TREE SPECIES	RATING	TREE SPECIES	RATING		
T2	High	PP DF, WF	High Moderate	PP, DF WF, WL, LP	High Moderate	Steep and cobbly soils locally	Steep benchy slopes in areas, wet areas
T3	Low to High	PP DF, WF	Low to Moderate Very low to Low	PP DF WF, WL	High Very low to Moderate Very to to Low	Steep and cobbly soils locally, shortened planting season due to south aspects	Steep benchy slopes in areas
T5	Low	PP	Very low	PP	Very low	Hot, dry sites; seasonally wet; puddling and compaction of soil	Soils rut easily during wet season
T6	Low to Moderate	WF WL, LP	Moderate to High High	LP, DF, WL WF PP, ES, AF	High Moderate Low	Steep slopes locally, cold soils, frost pockets	Steep benchy slopes in areas, wet areas
T7	Low	PP DF WF	Low to High Low to Moderate Very low to Moderate	PP DF WF, WL	High Low to Moderate Very low to Low	Seasonally wet and saturated soils, puddling and compaction of soil	Soils rut easily during wet season, soils moderately well drained
T8	High	PP DF, WF	Moderate Low	PP, DF WF, WL, LP	High Moderate	Steep and cobbly soils locally, shortened planting season due to south aspect	Steep benchy slopes in areas
U4	High	PP DF, WF	Moderate to High Low to Moderate	PP DF WF, WL	High Moderate to High Low to Moderate	Cobbly soils locally, shorter planting season on south aspects	Gentle slopes
U5	N/A	N/A	N/A	N/A	N/A	Non-forest site because of climatic conditions	Non-forest sites, gentle slopes, areas of shallow soils, fragile soil-vegetation site
V1	N/A to Low	PP	Very low to Low	PP	Very low to Low	Non-forest to non-commercial sites due to low precipitation	Non-forest to noncommercial forest site, gentle slopes
V2	High	PP DF, WF	Moderate to High Low to Moderate	PP DF WF, WL	High Moderate Low	Steep slopes, shorter planting season on south aspects, cobbly soils locally	Steep slopes, areas of shallow soils

TABLE OF INTERPRETATIONS - TIMBER

LANDTYPE NO.	SUSCEPTIBILITY TO RHIZOMATOUS GRASS COMPETITION	POTENTIALS FOR REGENERATION				LIMITATIONS FOR REGENERATION	CONSIDERATIONS FOR TREE HARVEST
		NATURAL		ARTIFICIAL			
		TREE SPECIES	RATING	TREE SPECIES	RATING		
V3	Low	PP DF	Low Very low to Low	PP DF	High Very low to Low	Steep slopes, cobbly soils, shortened planting season due to south aspects	Steep slopes, shallow soils, rock outcrop
V4	Low	PP on PP sites	Very low	PP on PP sites	Very low	Non-forest and non-commercial forests because of shallow, droughty soils	Non-forest to noncommercial forest sites, shallow soils, areas of steep slopes, fragile soil-vegetation sites
V5	N/A	N/A	N/A	N/A	N/A	Non-forest site due to very shallow, droughty soils	Non-forest sites, shallow soils, steep slopes, rock outcrop, fragile soil-vegetation site
V6	Low	WF WL, LP	Moderate to High High	LP, DF, WL WF PP, ES, AF	High Moderate Low	Cold soils, steep slopes	Steep slopes
V7	N/A	N/A	N/A	N/A	N/A	Non-forest sites to very shallow, droughty soils	Non-forest sites, shallow soils, gentle slopes, fragile soil-vegetation sites
V8	Low to High	PP DF	Low to Moderate Low	PP DF	High Low	Shallow and cobbly soils locally, shorter planting season on south aspects	Gentle slopes, areas of shallow soils
X3	N/A	N/A	N/A	N/A	N/A	Non-forest sites due to low precipitation	Non-forest site, steep slopes
X6	High	PP DF, WF	Moderate to High Low to Moderate	PP, DF WF, WL, LP	High Moderate	Cobbly soils	Gentle slopes
X7	Low	PP	Very low to Low	PP	Moderate to High	Marginal precipitation, cobbly soils locally, shorter planting season on south slopes	Gentle slopes
X8	N/A	N/A	N/A	N/A	N/A	Non-forest sites due to shallow soils and low precipitation	Gentle slopes, shallow soils in areas
X9	Low to High	PP DF	Low to Moderate Very low to Low	PP DF	High Very low to Low	Clayey soils, seasonally wet soils, puddling problems when wet, shortened planting season on south aspects	Gentle slopes, soils rut easily during wet season
Y1	N/A	N/A	N/A	N/A	N/A	Non-forest soils due to cold and/or shallow soils (subalpine conditions)	Non-forest site, fragile soil-vegetation site

TABLE OF INTERPRETATIONS - TIMBER

LANDTYPE NO.	SUSCEPTIBILITY TO RHIZOMATOUS GRASS COMPETITION	POTENTIALS FOR REGENERATION				LIMITATIONS FOR REGENERATION	CONSIDERATIONS FOR TREE HARVEST
		NATURAL		ARTIFICIAL			
		TREE SPECIES	RATING	TREE SPECIES	RATING		
Y2	Low to Moderate	WF WF, LP	Moderate to High High	LP, DF, WL WF PP, ES, AE	High Moderate Low	Cold soils; steep slopes, cobbly and stony soils, talus locally	Steep slopes, rock outcrop, talus slopes, ravelly soils in areas
Y3	Low to High	PP DF	Low Very low to Low	PP DF	High Very low to Low	Steep slopes, shortened planting season due to south aspect, cobbly soils locally	Steep slopes, rock outcrop
Y4	N/A to Low	N/A sites to PP sites	N/A to Very low	N/A sites to PP sites	N/A to Moderate	Non-forest to non-commercial forest sites due to shallow, droughty soils	Non-forest to noncommercial forest site, steep slopes, shallow soils, talus slopes
Y7	Low to High	LP WF	Moderate to High Low	LP, WL DF PP, WF	High Moderate Low	Cold soils, seasonally wet, cobbly soils locally	Gentle slopes, soils rut easily during wet season, wet areas
Y8	Low to Moderate	LP AF, ES	Low to High Low to High	LP ES AF	High Moderate Low	Cold soils (subalpine conditions)	Gentle slopes
Y9	High	PP EF, WF	Moderate Low	PP DF WF, WL	High Moderate Low	Steep and cobbly soils locally, shortened planting season due to south aspect	Moderately steep to steep slopes, areas of shallow soils

TABLE OF INTERPRETATIONS - HYDROLOGY

The following hydrology interpretations deal with landtype characteristics that influence water quality and quantity of stream flow.

Water Yield Class

This interpretation is an indication of the rate and amount of water yield expected from each soil. It is based on factors such as soil characteristics, infiltration rates, permeability, slope, climate, vegetation, and drainage patterns.

Class I - These soils have a high water detention storage capacity and a low rate of runoff. Little water is yielded to peak flows until detention storage capacity is exceeded or unless the soils are initially saturated or frozen. They are important in sustaining high base flow due to a relatively large volume of water held in detention storage.

Class II - These soils have a moderate water detention storage capacity and a moderate rate of runoff. Water contributes to both peak flows and base flow.

Class III - These soils have a low water detention storage capacity and a high rate of runoff. The storage capacity is low and easily exceeded with most of the water contributing to peak flow. Little water is yielded to sustain base flow.

Bedrock Hydrologic Characteristics

This interpretation indicates the relative capacity of bedrock to store and transmit water. The rating is based on bedrock kind, texture, type and extent of fracturing, frequency of jointing, bedding characteristics, and degree of weathering.

Class I - This indicates that the bedrock has a relatively high capacity to store water. The water transmission rate is low unless the storage capacity is exceeded. Rocks in this class include sandstones because of their texture, fracture, and bedding characteristics and basalts where water occurs in large tubes and other cavities or in the interflow zone between successive lava flows.

Class II - This indicates that the bedrock has a moderate capacity to store water. The rate of water transmission is moderate. Rocks in this class are generally hard to moderately hard, moderately fine textured, and moderately to highly fractured siltstone, mudstone, pyroclastics, argillite, and schist.

Class III - This indicates that the bedrock has a relatively low capacity to store water. The rate of water transmission is rapid. Rocks generally in this class are fractured,

coarse crystalline (i.e., granite, gabbro, and gneiss), and other hard-fractured rocks such as conglomerate.

Class IV - This indicates that the bedrock has both low storage capacity and low rate of water transmission. Rocks in this class are generally highly weathered, fine-textured, and lack open fracture channels.

Hydrologic Group

This interpretation is a grouping of soils into four classes, indicating the general infiltration and water movement ability of the soil and bedrock materials. This method of ratings has been developed by the Soil Conservation Service. The four groups are the standard SCS groupings and definitions.

Group A - Soils having high infiltration rates even when thoroughly wetted, consisting chiefly of deep, well to excessively drained sands and/or gravel. These soils have a high rate of water transmission and would result in a low runoff potential.

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

Group C - Soils having slow infiltration rates when thoroughly wetted, consisting chiefly of (1) soils with a layer between 20-40" that impedes the downward movement of water or (2) deep soils with moderately fine to fine textures and a slow infiltration rate. These soils have a slow rate of water transmission.

Group D - Soils having very slow infiltration rates when thoroughly wetted, consisting chiefly of (1) deep clay soils with high swelling potential, (2) soils with a high permanent water table, (3) soils with claypan or clay layer at less than 20" or near the surface, and (4) shallow soils over nearly impervious materials. These soils have a very slow rate of water transmission.

Sedimentation Yield Potential

This interpretation indicates the potential for water sedimentation of particles carried in suspension following timber harvest, road construction, or other activities. Factors considered in making ratings are soil texture and structure, drainage patterns, landform, and climate. This interpretation is made for the following:

Surface Layers - The portion of a soil extending from the mineral soil surface down to a layer that differs significantly in soil characteristics. These layers

can include the A, B, or C horizons. Example: A soil profile including a weak A, AC, and C horizon development in a sandy loam volcanic ash layer, 50 inches thick, overlying bedrock is considered as a surface layer.

Subsoil Layers - The soil materials lying between the surface layers and bedrock. They can include any soil horizon below the A horizon and differs from the surface layers significantly in soil characteristics.

Rating

Low - Sedimentation levels of soil particles are not expected to be significant following management activities.

Moderate - Sedimentation levels of soil particles may be significantly increased following management activities with moderate loss of water quality and damage to fisheries.

High - Sedimentation levels of soil particles are expected to be high following management activities. Streams become turbid and there is considerable loss of water quality and damage to fisheries.

N/A - Not applicable.

Expected Sediment Size - This interpretation indicates the expected sediment size reaching the streams resulting from erosion of each unit. It estimates the two dominate separates expected (gravel, sand, silt, or clay) from each soil unit. Variable is used when soil conditions are such that no separates are consistently dominate in the soil layer.

TABLE OF INTERPRETATIONS - HYDROLOGY

LANDTYPE NO.	WATER YIELD CLASS	BEDROCK HYDROLOGIC CHARACTER	HYDROLOGIC GROUP	SEDIMENTATION YIELD POTENTIAL			
				SURFACE LAYERS		SUBSOIL LAYERS	
				RATING	EXPECTED SEDIMENT SIZE	RATING	EXPECTED SEDIMENT SIZE
A1	I	-----	D	High	Silt and sand	High	Variable
A2	I	-----	B-C	High	Silt and sand	High	Variable
A4	I	-----	B-D	Moderate - High	Silt and sand	Moderate - High	Variable
B1	III	III	D	Moderate - High	Silt and sand	Moderate - High	Clay and silt
B4	III	III	D	Moderate - High	Sand and silt	Moderate - High	Clay and silt
B5	III	III	D	Moderate - High	Sand and silt	Moderate - High	Clay and silt
B6	II	III	B-C	Low	Sand and silt	Low	Clay and silt
B7	I-II	III	B	High	Sand and silt	Moderate	Clay and silt
B8	I-II	III	B	High	Sand and silt	Moderate	Clay and silt
B9	I-II	III	B	High	Sand and silt	Moderate	Clay and silt
C1	I-III	I	A-D	Low - High	Sand and silt	Low - High	Variable
C2	I-III	II-III	A-D	Low - High	Sand and silt	Low - High	Variable
C3	I-III	II-III	B-D	Low - High	Sand and silt	Low - High	Variable

TABLE OF INTERPRETATIONS - HYDROLOGY

LANDTYPE NO.	WATER YIELD CLASS	BEDROCK HYDROLOGIC CHARACTER	HYDROLOGIC GROUP	SEDIMENTATION YIELD POTENTIAL			
				SURFACE LAYERS		SUBSOIL LAYERS	
				RATING	EXPECTED SEDIMENT SIZE	RATING	EXPECTED SEDIMENT SIZE
C5	I	Variable	A	Moderate	Sand and silt	Low - High	Variable
C6	III	Variable	D	Low - High	Sand and silt	N/A	N/A
C7	II-III	Variable	B	Low - High	Sand and silt	Low - High	Variable
C8	II	Variable	B	Moderate	Sand and silt	Low - High	Variable
C9	I-II	II	A-B	Moderate - High	Sand and silt	Low - High	Variable
D1	III	I	C	Low	Sand and silt	Low	Sand and silt
E1	III	I	C	Low	Sand and silt	Low	Sand and silt
E2	III	I	B	Low	Sand and silt	Low	Sand and silt
E3	III	I	B	Low	Sand and silt	Low	Sand and silt
E4	III	I	C	Low	Sand and silt	Low	Clay and silt
E5	III	IV	C	Low	Sand and silt	Low	Clay and silt
E6	III	I	C	Low	Sand and silt	Low	Clay and silt
E7	III	I	C	Low	Sand and silt	Low	Sand and silt
E8	III	I	D	Low	Sand and silt	Low	Sand and silt

TABLE OF INTERPRETATIONS - HYDROLOGY

LANDTYPE NO.	WATER YIELD CLASS	BEDROCK HYDROLOGIC CHARACTER	HYDROLOGIC GROUP	SEDIMENTATION YIELD POTENTIAL			
				SURFACE LAYERS		SUBSOIL LAYERS	
				RATING	EXPECTED SEDIMENT SIZE	RATING	EXPECTED SEDIMENT SIZE
F1	III	Variable	A	Moderate	Sand and silt	Moderate	Sand and silt
F2	III	Variable	A	Moderate	Sand and silt	Moderate	Sand and silt
G1	III	IV	C	Low	Silt and clay	Low	Clay and silt
G2	III	IV	C	Low	Silt and clay	Low	Clay and silt
G3	III	IV	C	Low	Silt and clay	Low	Clay and silt
G7	III	I or IV	B	Low	Silt and sand	Low	Silt and sand
H2	III	I	D	Low	Silt and sand	Low	Silt and clay
H3	III	I	D	Low	Silt and sand	Low	Silt and clay
J0	III	I	D	Low	Silt and sand	Low	Silt and sand
J1	III	I	D	Low	Silt and sand	Low	Silt and sand
J2	III	II	C-D	Moderate	Variable	Moderate	Variable
J3	III	IV	C	Low	Silt and sand	Low	Clay and silt
J5	III	IV	C	Low	Clay and silt	Low	Clay and silt
J6	III	I	C	Low	Clay and silt	Low	Clay and silt

TABLE OF INTERPRETATIONS - HYDROLOGY

LANDTYPE NO.	WATER YIELD CLASS	BEDROCK HYDROLOGIC CHARACTER	HYDROLOGIC GROUP	SEDIMENTATION YIELD POTENTIAL			
				SURFACE LAYERS		SUBSOIL LAYERS	
				RATING	EXPECTED SEDIMENT SIZE	RATING	EXPECTED SEDIMENT SIZE
L1	III	IV	B	Low	Sand and silt	Low	Silt and clay
L2	II	IV	C	Moderate	Sand and silt	Moderate	Silt and clay
L3	III	IV	C-D	Moderate	Sand and silt	Moderate	Silt and clay
L5	I	IV	A	Low	Sand and silt	Low	Silt and clay
L6	I	IV	B	Moderate	Sand and silt	Moderate	Silt and clay
L7	III	IV	C-D	Moderate	Silt and clay	Moderate	Silt and clay
L8	II	IV	C	Moderate	Sand and silt	Moderate	Silt and clay
M1	I	II-III	B-C	High	Silt and clay	High	Silt and clay
M2	I	IV	B-C	High	Silt, clay, and sand	High	Silt and clay
M3	I	III	A-B	Moderate	Silt and clay	Moderate	Silt and clay
M8	I	II	B-C	High	Silt and sand	High	Silt and sand
N1	I	II	A	Moderate	Silt and sand	Moderate - High	Silt and clay
N2	I	II	A	Moderate	Silt and sand	Moderate	Silt and clay
N3	I-II	I-II	B	Moderate	Silt and sand	Moderate - High	Silt and clay

TABLE OF INTERPRETATIONS - HYDROLOGY

LANDTYPE NO.	WATER YIELD CLASS	BEDROCK HYDROLOGIC CHARACTER	HYDROLOGIC GROUP	SEDIMENTATION YIELD POTENTIAL			
				SURFACE LAYERS		SUBSOIL LAYERS	
				RATING	EXPECTED SEDIMENT SIZE	RATING	EXPECTED SEDIMENT SIZE
N4	III	II	D	Low - Moderate	Silt and sand	N/A	N/A
N5	II	II	B	Moderate	Silt and sand	Moderate - High	Silt and clay
N6	I-II	I-II	B	Moderate	Silt and sand	Moderate - High	Silt and clay
N7	III	I-II	D	Moderate	Silt and sand	N/A	N/A
N8	III	II	D	Low - Moderate	Silt and sand	N/A	N/A
N9	III	II	D	Low - Moderate	Silt and sand	N/A	N/A
P1	II	II-III	A-B	Low	Silt and sand	Low	Sand and silt
P2	II	II-III	B	Low	Silt and sand	Low	Silt and clay
P3	II	II-III	B-C	Low	Silt and sand	Low	Silt and clay
P4	III	II-III	D	Moderate	Silt and sand	Moderate	Silt and clay
P5	III	II-III	D	Moderate - High	Silt and sand	Moderate - High	Silt and clay
P8	II	II-III	C	Moderate	Silt and sand	Moderate	Silt and clay
P9	II	II-III	B	Low	Silt and sand	Low	Silt and sand

TABLE OF INTERPRETATIONS - HYDROLOGY

LANDTYPE NO.	WATER YIELD CLASS	BEDROCK HYDROLOGIC CHARACTER	HYDROLOGIC GROUP	SEDIMENTATION YIELD POTENTIAL			
				SURFACE LAYERS		SUBSOIL LAYERS	
				RATING	EXPECTED SEDIMENT SIZE	RATING	EXPECTED SEDIMENT SIZE
Q1	II-III	II	B	Moderate - High	Silt and sand	Moderate - High	Silt and sand
Q2	I-II	II	B	Moderate - High	Silt and sand	Moderate - High	Silt and sand
Q3	III	II	B	Moderate	Silt and sand	N/A	N/A
Q4	III	II	D	Moderate	Silt and sand	N/A	N/A
Q7	III	II	B	Moderate	Silt and sand	N/A	N/A
Q8	I-II	II	A	Moderate	Silt and sand	Moderate - High	Sand and silt
Q9	I	II	A	Moderate	Silt and sand	Moderate - High	Sand and silt
R1	II	II	B	Moderate	Silt and sand	Moderate	Sand and silt
R2	II	II	B	Moderate	Silt and sand	Moderate	Sand and silt
R3	I	II	A	Low	Silt and sand	Low	Sand and silt
R4	III	II	C	High	Silt and sand	N/A	N/A
R5	III	II	C	High	Silt and sand	N/A	N/A
R6	I	II	A	Low	Silt and sand	Low	Sand and silt
R7	II	II	A-B	Low	Silt and sand	Low	Sand and silt

TABLE OF INTERPRETATIONS - HYDROLOGY

LANDTYPE NO.	WATER YIELD CLASS	BEDROCK HYDROLOGIC CHARACTER	HYDROLOGIC GROUP	SEDIMENTATION YIELD POTENTIAL			
				SURFACE LAYERS		SUBSOIL LAYERS	
				RATING	EXPECTED SEDIMENT SIZE	RATING	EXPECTED SEDIMENT SIZE
S1	III	II-III	D	Low	Silt and sand	N/A	N/A
T2	II	IV	C	Moderate	Silt and sand	Moderate	Clay and silt
T3	III	IV	C-D	Moderate	Silt and sand	Moderate	Clay and silt
T5	III	IV	D	High	Silt and sand	High	Clay and silt
T6	I	IV	B	Low	Silt and sand	Low	Clay and silt
T7	III	IV	C-D	Moderate	Silt and sand	Moderate	Clay and silt
T8	II	IV	C	Moderate	Silt and sand	Moderate	Clay and silt
U4	I-II	IV	C	Moderate	Silt and sand	High	Clay and silt
U5	I-II	II	B	Moderate	Silt and sand	Moderate	Sand and silt
V1	III	III	C	Moderate	Silt and sand	Moderate	Sand and silt
V2	I-II	II	B	Moderate	Silt and sand	Low	Sand and silt
V3	II-III	II	B	Low - Moderate	Silt and sand	Low	Sand and silt
V4	III	II	D	Low	Silt and sand	N/A	N/A
V5	III	II	D	Low	Silt and sand	N/A	N/A

TABLE OF INTERPRETATIONS - HYDROLOGY

LANDTYPE NO.	WATER YIELD CLASS	BEDROCK HYDROLOGIC CHARACTER	HYDROLOGIC GROUP	SEDIMENTATION YIELD POTENTIAL			
				SURFACE LAYERS		SUBSOIL LAYERS	
				RATING	EXPECTED SEDIMENT SIZE	RATING	EXPECTED SEDIMENT SIZE
V6	I	II	A	Moderate	Silt and sand	Low	Sand and silt
V7	III	II	D	Low	Silt and sand	N/A	N/A
V8	III	II	C	Low	Silt and sand	Moderate	Sand and silt
X3	III	III	C	Moderate	Silt and sand	Moderate	Clay and silt
X6	II	III	B	Low	Silt and sand	Low	Clay and silt
X7	III	III	B	Moderate	Silt and sand	Moderate	Clay and silt
X8	III	II	D	High	Silt and sand	High	Clay and silt
X9	II	III	C	Moderate	Silt and clay	Moderate	Clay and silt
Y1	II-III	II-III	B-C	High	Silt and sand	High	Silt and sand
Y2	I-II	II-III	A-B	Moderate - High	Silt and sand	Moderate - High	Silt and sand
Y3	III	II-III	B-C	Moderate	Silt and sand	Moderate	Silt and clay
Y4	III	II-III	C-D	High	Silt and sand	High	Silt and clay
Y7	II	II-III	C	Moderate	Silt and sand	Moderate	Silt and clay
Y8	II	II-III	A-B	Moderate	Silt and sand	Moderate	Silt and sand
Y9	II	II-III	B-C	Moderate	Silt and sand	Moderate	Silt and clay

APPENDIX

TAXONOMY OF MODAL SITE SOILS (ESTIMATED) 1/

Landtype Symbol	Taxonomic Classification
A1	N/A
A2	N/A
A4	N/A
B1	Clayey-skeletal, montmorillonitic, mesic family of Lithic Argixerolls
B4	Clayey-skeletal, montmorillonitic, mesic family of Lithic Argixerolls
B5	Clayey-skeletal, montmorillonitic, mesic family of Lithic Argixerolls
B6	Loamy-skeletal, mixed, frigid family of Duric Argixerolls
B7	Loamy-skeletal, mixed, frigid family of Typic Haploxerolls
B8	Medial-skeletal, mixed, frigid family of Typic Vitrandepts
B9	Medial-skeletal, mixed, frigid family of Typic Vitrandepts
C1	N/A
C2	N/A
C3	N/A
C5	N/A
C6	N/A
C7	N/A
C8	N/A
C9	N/A
D1	Coarse-loamy, mixed, mesic family of Xerollic Camborthids
E1	Fine-loamy, mixed, mesic family of Xerollic Durargids
E2	Coarse-loamy, mixed, mesic family of Calciorthidic Haploxerolls
E3	Coarse-loamy, mixed, mesic family of Calciorthidic Haploxerolls
E4	Fine, montmorillonitic, mesic family of Abruptic Aridic Durixerolls
E5	Fine, montmorillonitic, frigid family of Pachic Palexerolls
E6	Fine-loamy, mixed, mesic family of Xerollic Camborthids
E7	Fine-loamy, mixed, mesic family of Xerollic Durargids
E8	Loamy, mixed, mesic, shallow family of Aridic Haploxerolls
F1	Coarse-loamy, mixed, mesic family of Durixerollic Camborthids
F2	Coarse-loamy over sandy or sandy-skeletal, mixed, mesic family of Calciorthidic Haploxerolls
G1	Fine, montmorillonitic, mesic family of Aridic Calcic Argixerolls
G2	Fine, montmorillonitic, mesic family of Aridic Calcic Argixerolls
G3	Fine, montmorillonitic, mesic family of Aridic Calcic Argixerolls
G7	Fine-silty, mixed, mesic family of Calcic Pachic Haploxerolls
H2	Loamy-skeletal, mixed, mesic family of Lithic Haploxerolls
H3	Loamy-skeletal, mixed, mesic family of Lithic Haploxerolls
J0	N/A
J1	Loamy-skeletal, mixed, mesic family of Lithic Haploxerolls
J2	N/A
J3	Clayey-skeletal, montmorillonitic, mesic family of Argic Durixerolls
J5	Loamy-skeletal, mixed, frigid family of Pachic Haploxerolls
J6	Loamy-skeletal, mixed, mesic family of Aridic Argixerolls
L1	Medial over clayey-skeletal, mixed, frigid family of Typic Vitrandepts
L2	Medial over clayey-skeletal, mixed, frigid family of Typic Vitranepts

1/ Assisted by Darwin J. Jeppesen, Soil Scientist, Bureau of Land Management, Prineville, Oregon.

L3	Clayey-skeletal, montmorillonitic, frigid family of Ultic Palexerolls
L5	Medial over loamy, mixed family of Entic Cryandepts
L6	Medial over clayey-skeletal, mixed, frigid family of Entic Cryandepts
L7	Fine, montmorillonic, frigid family of Argic Cryanquolls
L8	Medial over clayey, mixed, frigid family of Typic Vitranepts
M1	N/A
M2	N/A
M3	N/A
M8	N/A
N1	Medial over clayey, mixed, frigid family of Andic Xerochrepts
N2	Ashy over loamy-skeletal, mixed family of Entic Cryandepts
N3	Loamy-skeletal, mixed, frigid family of Lithic Argixerolls
N4	Loamy-skeletal, mixed, frigid family of Lithic Haploxerolls
N5	Loamy-skeletal, mixed, frigid family of Lithic Argixerolls
N6	Loamy-skeletal, mixed, frigid family of Lithic Argixerolls
N7	Loamy-skeletal, mixed, frigid family of Lithic Argixerolls
N8	Loamy-skeletal, mixed, frigid family of Lithic Haploxerolls
N9	Loamy-skeletal, mixed, frigid family of Lithic Haploxerolls
P1	Medial over loamy-skeletal, mixed, frigid family of Entic Cryandepts
P2	Medial over loamy-skeletal, mixed, frigid family of Typic Vitrandepts
P3	Fine-loamy, mixed, frigid family of Ultic Haploxerolls
P4	Loamy-skeletal, mixed, frigid family of Lithic Argixerolls
P5	Loamy-skeletal, mixed, frigid family of Lithic Haploxerolls
P8	Loamy-skeletal, mixed, frigid family of Lithic Ultic Argixerolls
P9	Medial over loamy, mixed, frigid family of Typic Vitrandepts
Q1	Loamy-skeletal, mixed, frigid family of Lithic Argixerolls
Q2	Coarse-loamy, mixed, frigid family of Typic Haploxerolls
Q3	Loamy-skeletal, mixed, frigid family of Lithic Xerochrepts
Q4	Loamy-skeletal, mixed, frigid family of Lithic Xerochrepts
Q7	Loamy-skeletal, mixed, frigid family of Lithic Xerochrepts
Q8	Loamy-skeletal, mixed, frigid family of Andic Xerochrepts
Q9	Medial over loamy-skeletal, mixed, frigid family of Xeric Eutrandepts
R1	Medial over loamy-skeletal, mixed, frigid family of Typic Vitrandepts
R2	Medial over loamy-skeletal, mixed, frigid family of Typic Vitrandepts
R3	Medial over loamy-skeletal, mixed, frigid family of Typic Vitrandepts
R4	Loamy-skeletal, mixed, frigid family of Lithic Haploxerolls
R5	Loamy-skeletal, mixed, frigid family of Lithic Haploxerolls
R6	Medial over loamy-skeletal, mixed, frigid family of Typic Vitrandepts
R7	Medial over loamy, mixed, frigid family of Typic Cryandepts
S1	N/A
T2	Medial over clayey, mixed, frigid family of Typic Vitrandepts
T3	Fine, montmorillonitic, frigid family of Ultic Palexerolls
T5	Very fine, montmorillonitic, mesic family of Palexerollic Chromoxererts
T6	Medial over clayey, mixed, frigid family of Entic Cryandepts
T7	Fine, montmorillonitic, frigid family of Argic Cryaquolls
T8	Medial over clayey, mixed, frigid family of Typic Vitrandepts

U4	Medial over clayey, montmorillonitic, frigid family of Andic Xerochrepts
U5	Fine-loamy, mixed, frigid family of Typic Argixerolls
V1	Fine-loamy, mixed, mesic family of Typic Argixerolls
V2	Medial over loamy-skeletal, mixed, frigid family of Andic Xerochrepts
V3	Loamy-skeletal, mixed, frigid family of Lithic Xerochrepts
V4	Loamy-skeletal, mixed, frigid family of Lithic Xerochrepts
V5	Loamy-skeletal, mixed, frigid family of Lithic Xerochrepts
V6	Ashy over loamy, mixed, frigid family of Typic Vitrandepts
V7	Loamy-skeletal, mixed, frigid family of Lithic Xerochrepts
V8	Coarse-loamy, mixed, frigid family of Lithic Xerochrepts
X3	Fine, montmorillonitic, mesic family of Pachic Palexerolls
X6	Medial-skeletal, mixed, frigid family of Typic Vitrandepts
X7	Loamy-skeletal, mixed, frigid family of Typic Haploxerolls
X8	Fine, montmorillonitic, frigid family of Paralithic Paleoxerolls
X9	Fine, montmorillonitic, frigid family of Pachic Paleoxerolls
Y1	Loamy-skeletal, mixed, frigid family of Typic Xerochrepts
Y2	Medial over loamy-skeletal, mixed, frigid family of Entic Cryandepts
Y3	Loamy-skeletal, mixed, mesic family of Ultic Argixerolls
Y4	Clayey-skeletal, montmorillonitic, mesic family of Lithic Argixerolls
Y7	Fine-loamy, mixed, frigid family of Ultic Argixerolls
Y8	Medial over loamy, mixed, frigid family of Entic Cryandepts
Y9	Loamy-skeletal, mixed, frigid family of Ultic Argixerolls

LANDTYPES OF CROOKED RIVER NATIONAL GRASSLAND
ADAPTED FROM SELECTED SOIL SERIES

Landtype	Soil Series
D1	Deschutes
E1	Madras
E2	Era
E3	Era
E4	Lamonta
E5	Prag
E6	Agency
E7	Madras
E8	McCoin
F1	Metolius
F2	Court
G1	Simas
G2	Simas
G3	Simas
G7	Currant with some Tub
H2	Lickskillet
H3	Lickskillet
J0	(No series recognized - rockland)
J1	Bakeoven
J2	(No series recognized - rough and broken land)
J3	Gribble
J5	Giuser and Prag
J6	Searles

SOIL MATERIALS TESTING RESULTS

The following contains engineering soil materials testing results for some representative soil materials. The testing was done by the Deschutes National Forest Soil Materials Testing Lab.

The laboratory test data presented in this appendix is intended to be used as a guide and indicator for planning purposes only.

LANDTYPE NO. B7 DEPTH: 10-25" SOIL LAYER: Surface
LOCATION: NE¼, SE¼, Sec. 22, T.13 S., R.17 E. MECHANICAL ANALYSIS
CLASSIFICATION: UNIFIED: GM'd' ASSHO: -
Liquid Limit: 20 Plastic Limit: 0
Plasticity Index: Nonplastic
Specific Gravity (#40 material) 2.58

Hydrometer Analysis	
Diameter MM	% Passing
0.036	75.87
0.023	33.73
0.0132	31.71
0.0094	28.67
0.0067	25.63
0.0034	18.54
0.002	15.7
0.0014	14.49

Sieve Size	% Passing
3"	100
1"	98
3/4"	61
1/2"	58
3/8"	56
#4	54
#10	50
#20	46
#40	41
#60	38
#100	34
#200	28

LANDTYPE NO. B9 DEPTH: 10-20" SOIL LAYER: Surface (ash)
LOCATION: SE¼, NE¼, Sec. 22, T.13 S., R.17 E. MECHANICAL ANALYSIS
CLASSIFICATION: UNIFIED: SM'd' ASSHO: -
Liquid Limit: 20-30 Plastic Limit: 0
Plasticity Index: Nonplastic
Specific Gravity (#40 material) 2.52

Hydrometer Analysis	
Diameter MM	% Passing
0.04	53.15
0.02	46.97
0.01	36.67
0.0098	30.49
0.0070	24.31
0.0035	18.13
0.002	15.05
0.0015	14.01

Sieve Size	% Passing
3"	100
1"	100
3/4"	100
1/2"	99
3/8"	98
#4	95
#10	89
#20	80
#40	65
#60	51
#100	39
#200	26

SOIL MATERIALS TESTING RESULTS

LANDTYPE NO. L2 DEPTH: 18-30" SOIL LAYER: Subsoil
LOCATION: SE¼, SW¼, Sec. 12, T.12 S., R.18 E.
CLASSIFICATION: UNIFIED: SC ASSHO: -
Liquid Limit: 28.6 Plastic Limit: 18.8
Plasticity Index: 9.8
Specific Gravity (< #40 material)

Hydrometer Analysis	Diameter MM	% Passing
	0.035	24.06
	0.0225	23.07
	0.0131	20.10
	0.0093	18.12
	0.0066	16.14
	0.0033	12.38
	0.002	12.24
	0.0014	12.18

MECHANICAL ANALYSIS

Sieve Size	% Passing
3"	100
1"	88
3/4"	85
1/2"	83
3/8"	82
#4	69
#10	52
#20	40
#40	32
#60	27
#100	22
#200	16

LANDTYPE NO. L6 DEPTH: 19-30" SOIL LAYER: Subsoil
LOCATION: SE¼, NW¼, Sec. 2, T.13 S., R.23 E.
CLASSIFICATION: UNIFIED: GM-GC ASSHO: -
Liquid Limit: 25 Plastic Limit: 19.1
Plasticity Index: 6
Specific Gravity (< #40 material) 2.68

Hydrometer Analysis	Diameter MM	% Passing
	0.0330	56.73
	0.0213	50.79
	0.0126	43.86
	0.0091	38.91
	0.0064	36.93
	0.0032	30.89
	0.002	27.12
	0.0014	25.24

MECHANICAL ANALYSIS

Sieve Size	% Passing
3"	100
1"	73
3/4"	73
1/2"	71
3/8"	68
#4	61
#10	54
#20	47
#40	43
#60	40
#100	36
#200	30

LANDTYPE NO. N6 DEPTH: 6-12" SOIL LAYER: Surface
LOCATION: SW¼, NE¼, Sec. 24, T.10 S., R.28 E.
CLASS.: UNIFIED: GMu ASSHO: A-7-5(2)
Liquid Limit: 45.7 Plastic Limit: 34.5
Plasticity Index: 11.0
Specific Gravity (< #40 material)

Hydrometer Analysis	Diameter MM	% Passing
	0.0305	34.16
	0.0197	31.50
	0.0119	25.14
	0.0085	21.96
	0.0061	18.86
	0.0031	14.09
	0.0013	10.38

MECHANICAL ANALYSIS

Sieve Size	% Passing
3"	100
1"	70.59
3/4"	68.92
1/2"	64.47
3/8"	62.96
#4	58.91
#10	54.79
#20	51.11
#40	48.64
#60	46.75
#100	44.76
#200	41.83

SOIL MATERIALS TESTING RESULTS

LANDTYPE NO. P5 DEPTH: 3-14" SOIL LAYER: Surface
LOCATION: SE¼, NE¼, Sec. 10, T.13 S., R.23 E.
CLASSIFICATION: UNIFIED: GM'u' ASSHO: -
Liquid Limit: 30 Plastic Limit: 23.8
Plasticity Index: 6
Specific Gravity (< #40 material) 2.60

Hydrometer Analysis	Diameter MM	% Passing
	0.0375	16.46
	0.0244	6.36
	0.0141	5.35
	0.0100	4.34
	0.0071	4.34
	0.0035	4.34
	0.0020	2.90
	0.0014	2.32

MECHANICAL ANALYSIS

Sieve Size	% Passing
3"	100
1"	61
3/4"	56
1/2"	54
3/8"	53
#4	50
#10	44
#20	35
#40	30
#60	27
#100	24
#200	21

LANDTYPE NO. P9 DEPTH: 0-4" SOIL LAYER: Surface
LOCATION: SE¼, SE¼, Sec. 3, T.13 S., R.23 E.
CLASSIFICATION: UNIFIED: ML ASSHO: -
Liquid Limit: 40-50 Plastic Limit: 0
Plasticity Index: Nonplastic
Specific Gravity (< #40 material) 2.45

Hydrometer Analysis	Diameter MM	% Passing
	0.0346	58.06
	0.0222	23.87
	0.0133	41.58
	0.0097	33.18
	0.0070	26.88
	0.0035	19.01
	0.002	16.02
	0.0015	15.23

MECHANICAL ANALYSIS

Sieve Size	% Passing
3"	100
1"	100
3/4"	100
1/2"	100
3/8"	100
#4	99
#10	98
#20	94
#40	88
#60	82
#100	73
#200	55

LANDTYPE NO. P9 DEPTH: 10-16" SOIL LAYER: Surface
LOCATION: SE¼, SE¼, Sec. 3, T.13 S., R.23 E.
CLASSIFICATION: UNIFIED: ML ASSHO: -
Liquid Limit: 20-30 Plastic Limit: 0
Plasticity Index: Nonplastic
Specific Gravity (< #40 material) 2.40

Hydrometer Analysis	Diameter MM	% Passing
	0.0383	33.80
	0.0246	27.32
	0.0144	24.08
	0.0103	18.68
	0.0073	15.44
	0.0036	8.96
	0.0020	6.49
	0.0015	5.72

MECHANICAL ANALYSIS

Sieve Size	% Passing
3"	100
1"	100
3/4"	100
1/2"	100
3/8"	100
#4	99
#10	98
#20	94
#40	88
#60	82
#100	72
#200	52

SOIL MATERIALS TESTING RESULTS

LANDTYPE NO. P9 DEPTH: 18-24" SOIL LAYER: Subsoil (Buried)
LOCATION: SE¼, SE¼, Sec. 3, T.13 S., R.23 E.
CLASSIFICATION: UNIFIED: SM'd' ASSHO: -
Liquid Limit: 20-30 Plastic Limit: 0
Plasticity Index: Nonplastic
Specific Gravity (< #40 material) 2.42

Hydrometer Analysis	Diameter MM	% Passing
	0.0389	24.93
	0.0247	23.86
	0.0143	22.79
	0.0102	18.51
	0.0073	15.30
	0.0036	9.95
	0.0020	7.50
	0.0015	6.74

MECHANICAL ANALYSIS

Sieve Size	% Passing
3"	100
1"	100
3/4"	94
1/2"	90
3/8"	90
#4	90
#10	85
#20	73
#40	64
#60	54
#100	50
#200	45

LANDTYPE NO. Q1 DEPTH: 6-12" SOIL LAYER: Surface
LOCATION: SE¼, SW¼, Sec. 8, T.20 S., R.28 E.
CLASS.: UNIFIED: SMd ASSHO: A-4-(0)
Liquid Limit: 27 Plastic Limit: 0
Plasticity Index: Nonplastic
Specific Gravity (< #40 material)

Hydrometer Analysis	Diameter MM	% Passing
	0.0311	35.56
	0.0205	29.92
	0.0127	23.33
	0.0091	19.53
	0.0065	16.28
	0.0033	10.29
	0.0013	5.93

MECHANICAL ANALYSIS

Sieve Size	% Passing
3"	100
1"	90.50
3/4"	88.39
1/2"	84.48
3/8"	82.29
#4	75.52
#10	69.87
#20	66.53
#40	62.66
#60	58.17
#100	52.92
#200	45.51

LANDTYPE NO. R2 DEPTH: 18-25" SOIL LAYER: Subsoil
LOCATION: SE¼, NW¼, Sec. 33, T.12 S., R.18 E.
CLASSIFICATION: UNIFIED: GM'd' ASSHO: -
Liquid Limit: 20-30 Plastic Limit: 0
Plasticity Index: Nonplastic
Specific Gravity (< #40 material) 2.81

Hydrometer Analysis	Diameter MM	% Passing
	0.0305	60.43
	0.0195	58.49
	0.0120	39.09
	0.0086	35.21
	0.0062	29.39
	0.0031	21.63
	0.0020	19.26
	0.0013	17.75

MECHANICAL ANALYSIS

Sieve Size	% Passing
3"	100
1"	68
3/4"	63
1/2"	61
3/8"	60
#4	53
#10	45
#20	41
#40	40
#60	37
#100	32
#200	20

SOIL MATERIALS TESTING RESULTS

LANDTYPE NO. R6 DEPTH: 27-40" SOIL LAYER: Subsoil
LOCATION: NW¼, NW¼, Sec. 13, T.12 S., R.18 E. MECHANICAL ANALYSIS
CLASSIFICATION: UNIFIED: GM'd' ASSHO: -
Liquid Limit: 21.8 Plastic Limit: 18.9
Plasticity Index: 2.9
Specific Gravity (< #40 material) 2.75

Hydrometer Analysis	Diameter MM	% Passing
	0.0338	35.57
	0.0214	34.59
	0.0124	33.61
	0.0089	27.73
	0.0065	19.89
	0.0032	17.93
	0.0020	16.69
	0.0013	15.97

Sieve Size	% Passing
3"	100
1"	69
3/4"	66
1/2"	61
3/8"	58
#4	47
#10	35
#20	26
#40	21
#60	18
#100	16
#200	14

LANDTYPE NO. T6 DEPTH: 2-15" SOIL LAYER: Surface (ash)
LOCATION: SW¼, SE¼, Sec. 19, T.12 S., R.20 E. MECHANICAL ANALYSIS
CLASSIFICATION: UNIFIED: SM'd' ASSHO: -
Liquid Limit: 20-30 Plastic Limit: 0
Plasticity Index: Nonplastic
Specific Gravity (< #40 material)

Hydrometer Analysis	Diameter MM	% Passing
	0.0396	24.31
	0.0254	17.77
	0.0148	15.59
	0.0105	14.50
	0.0074	12.32
	0.0037	10.14
	0.0020	7.61
	0.0015	6.87

Sieve Size	% Passing
3"	100
1"	100
3/4"	100
1/2"	99
3/8"	99
#4	98
#10	96
#20	91
#40	84
#60	76
#100	66
#200	41

LANDTYPE NO. V3 DEPTH: 6-12" SOIL LAYER: Surface
LOCATION: SE¼, NE¼, Sec. 26, T.15 S., R.29 E. MECHANICAL ANALYSIS
CLASS.: UNIFIED: GMu ASSHO: A-1-6(0)
Liquid Limit: 49.2 Plastic Limit: 0
Plasticity Index: Nonplastic
Specific Gravity (< #40 material)

Hydrometer Analysis	Diameter MM	% Passing
	0.0331	14.18
	0.0216	11.00
	0.0128	8.45
	0.0092	7.29
	0.0066	6.20
	0.0033	4.26
	0.0014	2.51

Sieve Size	% Passing
3"	100
1"	78
3/4"	-
1/2"	65.19
3/8"	61.66
#4	52.40
#10	42.01
#20	34.46
#40	28.80
#60	24.98
#100	21.53
#200	18.07

SOIL MATERIALS TESTING RESULTS

LANDTYPE NO. Y7 DEPTH: 2-15" SOIL LAYER: Surface
LOCATION: SE¼, NE¼, Sec. 10, T.13 S., R.23 E.
CLASSIFICATION: UNIFIED: SM'u' ASSHO: -
Liquid Limit: 34.6 Plastic Limit: 31.4
Plasticity Index: 2.2
Specific Gravity (<#40 material)

Hydrometer Analysis	Diameter MM	% Passing
	0.0315	58.40
	0.0200	56.45
	0.0120	46.70
	0.0087	40.85
	0.0063	30.13
	0.0031	28.18
	0.0020	22.81
	0.0013	19.40

MECHANICAL ANALYSIS

Sieve Size	% Passing
3"	100
1"	100
3/4"	100
1/2"	100
3/8"	99
#4	95
#10	87
#20	75
#40	61
#60	50
#100	40
#200	32

LABORATORY ANALYSIS
(OREGON STATE UNIVERSITY - SOIL PHYSICS LAB.)

LANDTYPE	LOCATION	DEPTH (INCHES)	HORIZON	COARSE FRAGMENTS > 2 MM % BY WEIGHT	PARTICLE SIZE DISTRIBUTION (% OF MINUS 2 MM) SAND	SILT	CLAY	USDA TEXTURE ON > 2 MM	CLOD B.D.	% SOIL MOISTURE BY BAR TENSION 0.1 ATM	0.33 ATM	0.8 ATM	5.0 ATM	15.0 ATM
S143 B7	NE¼, SW¼, Sec. 9, T.13 S., R.18 E.	0-10	A	54.87	36.61	48.81	14.55	Loam	--	37.25	29.47	20.80	13.46	11.08
		10-25	AC	66.23	40.71	41.49	17.80	Loam	--	33.81	26.14	19.21	13.31	11.18
		25-33	II B Buried Soil	85.19	36.04	29.32	34.64	Clay loam	--	52.64	44.08	38.26	31.91	28.27
S142 B9	SE¼, SW¼, Sec. 5, T.13 S., R.18 E.	0-1	A1	-	-	-	-	-		-	-	-	-	-
		1-17	AC	56.58	53.27	40.39	6.34	Sandy loam	--	46.78	32.80	19.79	9.99	9.31
		17-29	II B Buried Soil	77.83	51.40	35.32	13.28	Loam	--	33.64	27.15	21.26	16.76	15.18
T122 L3	NW¼, NE¼, Sec. 9, T.18 S., R.20 E.	2-12	A Compacted	6.08	42.98	43.20	13.82	Loam	1.12 (Compacted layer)	42.45	28.74	18.90	11.78	10.01
S135 L3	SW¼, SE¼, Sec. 23, T.17 S., R.20 E.	0-8	Surface Mixed Ash	9.35	29.81	46.50	23.69	Loam	1.30	39.34	29.46	22.87	16.68	14.61
		12-20	II B	41.73	34.24	37.39	28.37	Clay loam	1.67	51.84	40.90	34.11	27.77	24.63
S108 L6	SE¼, NW¼, Sec. 2, T.12 S., R.23 E.	8-14	AC Ash	7.99	33.08	52.78	14.14	Silt loam	0.98	49.71	34.24	21.90	12.86	10.84
		16-33	II B1	59.81	15.88	30.40	53.72	Clay	1.89	63.37	51.78	43.18	34.73	31.25
S115 P3	NW¼, NW¼, Sec. 32, T.14 S., R.24 E.	0-7	A	18.51	24.31	55.74	19.95	Silt loam	1.27	42.96	34.90	28.15	19.05	15.15
		7-19	II B	64.44	21.85	32.90	45.25	Clay		75.56	64.20	55.05	44.82	40.16
S62 P4	SW¼, NW¼, Sec. 35, T.14 S., R.22 E.	0-10	A	28.11	30.11	49.78	20.08	Loam	1.48	36.75	27.28	20.99	14.32	12.46
S99 T6	NW¼, SE¼, Sec. 15, T.14 S., R.20 E.	2-6	AC (Ash)	8.40	48.95	44.28	6.77	Sandy loam		54.63	32.54	20.72	11.28	8.95
		33-39	Buried Soil	23.49	36.22	45.01	18.77	Loam	1.47	33.44	26.17	21.02	15.98	13.76

CHEMICAL ANALYSIS
(OREGON STATE UNIVERSITY - SOIL TESTING LAB.)

LANDTYPE	DEPTH (INCHES)	pH	ORGANIC MATTER % (OM)	TOTAL NITROGEN % (N)	P (PPM)	CATION EXCHANGE CAPACITY MEG/100 G. (CRC)	EXTRACTABLE CATIONS				TOTAL BASES (MEG/100 G)
							K (MEG/100 G)	Ca (MEG/100 G)	Mg (MEG/100 G)	Na (MEG/100 G)	
B7	0-10	6.8	4.67	0.11	32	24.3	1.48	16.9	3.9	-	22.28
	10-25	7.1	1.26	0.04	15	18.7	.91	12.0	4.8	-	17.71
B9	0-1	6.6	5.57	0.13	50	17.5	1.20	8.3	1.5	-	11.00
	1-17	6.4	1.47	0.04	45	17.6	0.59	7.1	2.1	-	9.79
L3	0-8	6.9	3.89	0.12	51	28.6	2.4	17.7	6.5	-	26.60
L6	8-14	5.9	1.26	0.06	34	17.6	1.8	7.7	1.8	-	11.30
T6	2-6	6.7	1.52	0.05	73	17.4	1.07	7.1	0.99	-	9.16

GLOSSARY

ALLUVIUM - A general term for all detrital material deposited or in transit by streams, including gravel, sand, silt, clay, and all variations and mixtures of these. Unless otherwise noted, alluvium is unconsolidated.

ANDESITE A dark gray to black, dense, fine-grained extrusive igneous rock. Very similar to basalt.

ASH, VOLCANIC Uncemented pyroclastic material consisting of fragments mostly under 4 mm in diameter. Coarse ash is from ¼ to 4 mm in grain size; fine ash is below ¼ mm. Without a qualifying adjective, the term should be applied only to essential ejecta.

AVAILABLE WATER The portion of water in a soil that can be absorbed by plant roots, usually considered to be that water held in the soil against a tension of up to approximately 15 bars.

AVAILABLE WATER HOLDING CAPACITY The capacity to store water available for use by plants, usually expressed in linear depths of water per unit depth of soil. Commonly defined as the difference between the percentage of soil water at field capacity and the percentage at wilting point. This difference multiplied by the bulk density and divided by 100 gives a value in surface inches of water per inch depth of soil.

BASALT A very dark to black, dense, fine-grained extrusive igneous rock. Very similar to andesite.

BEDROCK The more or less solid rock in place either on or beneath the surface of the earth. It may be soft or hard and have a smooth or irregular surface.

BENCHY A landscape with slopes that are level to gently sloping, broken by steep slope breaks.

BRECCIA - A rock composed of coarse angular fragments cemented together.

CLASSIFICATION - The systematic arrangement of soils into groups or categories on the basis of their characteristics. Broad groupings are made on the basis of general characteristics and subdivisions on the basis of more detailed differences in specific properties. In the United States, the following system has been used since 1938 with additional great soil groups added in 1949 (from Soil Survey Staff, SCS, USDA, 1960, Soil classification: A comprehensive system - 7th Approximation. P. 9. U.S. Govt. Printing Office, Washington). On January 1, 1965, a new USDA soil classification system (soil taxonomy) was adopted for use in publications by the National Cooperative Soil Survey.

CLASTIC SEDIMENTS - Sediments transported into their place of deposition; i.e., sandstone, siltstone.

CLAY - A soil separate less than .002 millimeters in diameter. As a soil textural class, less than 45 percent sand and less than 40 percent silt.

COARSE FRAGMENTS - Rock or mineral particles greater than 2.0 millimeters in diameter.

COARSE TEXTURE - The texture exhibited by sands, loamy sands, and sandy loams except very fine sandy loam. A soil containing large quantities of these textural classes (United States usage).

COBBLY - Used to modify textural classes and identifies that the volume of 3 to 10 inch in diameter rock fragments in the soil ranges from 35 to 50 percent; very cobbly ranges from 50 to 80 percent; and extremely cobbly exceeds 80 percent.

COLLUVIUM - Soil material or rock fragments moved downslope by gravitational force in the form of soil creep, slides, and local wash.

COLOR - See Munsell color system.

COMPACTION - The packing together of soil particles by forces exerted at the soil surface resulting in increased soil density.

COMPETENCY - Relative inherent strength of rock as it occurs on the landscape, based on degree of weathering, fracturing, hardness, stability, and failures observed:

Competent - No failures within rock unit observed. Rocks of unit are stable and have strong resistance to mass movement.

Moderately competent - Some failures are noted. Rock of the unit are moderately stable and have some resistance to mass movement.

Incompetent - Failures are common to rock unit. Rocks of the unit are soft, deeply weathered, and have high potential for mass movement.

COMPLEX - An association in which two landtypes or a landtype and a miscellaneous landtype are so intricately mixed that it is not practical to show them separately at the scale of mapping used.

CONGLOMERATE - A cemented clastic rock containing rounded fragments in a finer groundmass.

CONSISTENCY - (1) The resistance of a material to deformation or rupture. (2) The degree of cohesion or adhesion of the soil mass. Terms used for describing consistency at various soil moisture contents are:

Wet soil - Nonsticky, slightly sticky, sticky, very sticky, nonplastic, slightly plastic, plastic, and very plastic.

Moist soil - Loose, very friable, friable, firm, very firm, and extremely firm.

Dry soil - Loose, soft, slightly hard, hard, very hard, and extremely hard.

CREEP - Slow mass movement of soil and soil material down relatively steep slopes primarily under the influence of gravity but facilitated by saturation with water and by alternate freezing and thawing.

CRITICAL SOIL - The term "critical soil" is frequently used by laymen, but it is a meaningless term unless it is related to a specific function. Many soils may be critical for one reason or another, but different soils may not be critical for the same reasons. For example, a deep, wet, plastic, and unstable soil will be critical in relation to road location and stability. This soil is not critical in relation to regeneration problems. Another soil may be very shallow over hard bedrock. This soil is not critical from the standpoint of road stability but may be critical as to regeneration problems. It may also be critical in relation to surface erosion. From these two samples, it becomes obvious that the term "critical soil" must be defined by the user in relation to its intended purpose.

DEPTH, EFFECTIVE SOIL - The depth of soil material that plant roots can penetrate readily to obtain water and plant nutrients. It is the depth to a layer that differs sufficiently from the overyling material in physical or chemical properties to prevent or seriously retard the growth of roots.

DUFF - The more or less firm organic layer on top of mineral soil, consisting of fallen vegetative matter in the process of decomposition, including everything from pure humus below to the litter on the surface. Duff is a general, nonspecific term.

DURIPAN - A subsurface horizon that is cemented by silica.

EROSION - (1) The wearing away of the land surface by running water, wind, ice, or other geological agents, including such processes as gravitational creep. (2) Detachment and movement of soil or rock fragments by water, wind, ice, or gravity. The following terms are used to describe different types of water erosion:

> Accelerated erosion - Erosion much more rapid than normal, natural, or geologic erosion, primarily as a result of the influence of the activities of man or, in some cases, of other animals or natural catastrophes that expose base surfaces; for example, fires.
>
> Geological erosion - The normal or natural erosion caused by geological processes acting over long periods and resulting in the wearing away of mountains, the building up of floodplains, coastal plains, etc. Syn. natural erosion.
>
> Gully erosion - The erosion process whereby water accumulates in narrow channels and, over short periods, removes the soil from this narrow area to considerable depths, ranging from 1 to 2 feet to as much as 75 to 100 feet.
>
> Natural erosion - Wearing away of the earth's surface by water, ice, or other natural agents under natural environmental conditions of climate, vegetation, etc., undisturbed by man. Syn. geological erosion.
>
> Normal erosion - The gradual erosion of land used by man which does not greatly exceed natural erosion.
>
> Rill erosion - An erosion process in which numerous small channels only several inches deep are formed; occurs mainly on recently cultivated soils.

Sheet erosion - The removal of a fairly uniform layer of soil from the land surface by runoff water.

Splash erosion - The spattering of small soil particles caused by the impact of raindrops on wet soils. The loosened and spattered particles may or may not be subsequently removed by surface runoff.

EXTRUSIVE BEDROCK - This applies to those igenous rocks derived from volcanic lavas that cooled on the surface of the earth. This lava cools rapidly and forms fine-textured rocks such as basalt and andesite.

FINE TEXTURE - Consisting of or containing large quantities of the fine fractions, particularly of silt and clay. (Includes all clay loams and clays; that is, clay loam, sandy clay loam, silty clay loam, sandy clay, silty clay, and clay textural classes. Sometimes subdivided into clayey texture and moderately fine texture.)

FRIABLE - Easy to break, crumble, or crush.

GEOMORPHOLOGY - The study of landforms as they relate to geologic composition and history.

GRAVELLY - Used to modify textural classes and identifies that the volume of 2 mm to 3 inch in diameter rock fragments in the soil ranges from 35 to 50 percent; very gravelly ranges from 50 to 80 percent; and extremely gravelly exceeds 80 percent.

GRAYWACKE - A loose and general term for sandstone containing significant quantities of clay materials.

HUMMOCKY - Hilly, uneven landscape resulting from deep-seated soil movement, usually of a rotational nature.

INCLUSION - Soil type found within a mapping unit that is not extensive enough to be mapped separately or as part of a complex.

INFILTRATION - The flow of a liquid into a substance through pores or other openings, connoting flow into a soil in contradistinction to the word percolation which connotes flow through a porous substance.

INTRUSIVE BEDROCK - This applies to those rocks derived from magmas that have been injected into older rocks at depth without reaching the surface. These magmas are slow-cooling and form coarse-textured rocks, such as granite.

LACUSTRINE DEPOSIT - Material deposited in lake water and later exposed either by lowering of the water level or by the elevation of the land.

LANDFORM - Structural configuration of the topography as a result of past and present geological activity.

LANDSLIDE - The perceptible downward sliding or falling of a relatively dry mass of earth, rock, or mixture of the two.

LANDTYPE - The basic unit of landscape stratification. It delineates and identifies naturally-occurring bodies on the landscape consisting of unique, characteristic soil mantle, bedrock, vegetation, climate, hydrology, and landform features which are significant to management use or interpretations.

LOESS - Fine-grained material, dominantly of silt-sized particles, that has been deposited by wind.

MAPPING UNIT - Any delineated area shown on a soil map that is identified by letters and numbers. A mapping unit may be a landtype, a miscellaneous landtype, or a complex of landtypes.

MAPPING UNIT COMPLEX - See complex.

MASSIVE - Soil structure or bedrock condition in which there is no observable aggregation or no definite orderly arrangement of natural lines of weakness.

MASS MOVEMENT - All movement of soil and bedrock materials occurring below the soil surface such as landslips, landflows, rock slides, slumps, etc.

MEDIUM TEXTURE - Intermediate between fine-textured and coarse-textured (soils). (It includes the following textural classes; very fine sandy loam, loam, silt loam, and silt.)

MISCELLANEOUS LANDTYPE - A mapping unit for areas of land that have little or no natural soil or have properties that are too variable and unpredictable for classification.

MODERATELY-COARSE TEXTURE - Consisting predominantly of coarse particles. (In soil textural classification, it includes all the sandy loams except the very fine sandy loam.)

MODERATELY-FINE TEXTURE - Consisting predominantly of intermediate-size (soil) particles or with relatively small amounts of fine or coarse particles. (In soil textural classification, it includes clay loam, sandy clay loam, and silty clay loam.)

MOISTURE TENSION - The equivalent negative pressure in the soil water. It is equal to the equivalent pressure that must be applied to the soil water to bring it to hydraulic equilibrium, through a porous permeable wall or membrane, with a pool of water of the same compositions. The pressures used and the corresponding percentages most commonly determined are:

> Fifteen-bar percentage - The percentage of water contained in a soil that has been saturated, subjected to, and is in equilibrium with an applied pressure of 15 bars. (Pressure applied in a pressure membrane or ceramic pressure plate apparatus. Usually expressed as a weight percentage but may be expressed as a volume percentage. Approximately the same as the fifteen-atmosphere percentage.)

One-third bar percentage - The percentage of water contained in a soil that has been saturated, subjected to, and is in equilibrium with an applied pressure of 1/3 bar. (Pressure applied in a ceramic plate apparatus. Usually expressed as a weight percentage. Approximately the same as one-third atmosphere percentage. Also, for medium to coarse-textured soils approximately numerically equal to moisture equivalent.)

MUDSTONE - Soft, fine-grained, gray to black sedimentary rock composed primarily of clay minerals. It lacks cleavage planes parallel to stratification and typically breaks into small block-like fragments.

MUNSELL COLOR SYSTEM - A color designation system that specifies the relative degrees of the three simple variables of color; hue, value, and chroma. For example: 10YR 6/4 is a color (of soil) with a hue = 10YR, value = 6, and chroma = 4. These notations can be translated into several different systems of color names as desired.

PARENT MATERIAL - The unconsolidated and more or less chemically weathered mineral or organic matter from which the solum of soils is developed by pedogenic processes.

PERCOLATION, SOIL WATER - The downward movement of water through soil, especially the downward flow of water in saturated or nearly saturated soil at hydraulic gradients of the order of 1.0 or less.

PERMEABILITY, SOIL - (1) The ease with which gases, liquids, or plant roots penetrate or pass through a bulk mass of soil or a layer of soil. Since different soil horizons vary in permeability, the particular horizon under question should be designated. (2) The property of a porous medium itself that relates to the ease with which gases, liquids, or other substances can pass through it. Previously, frequently considered the "k" in Darcy's law. The "k" in intrinsic permeability.

pH, SOIL - The negative logarithm of the hydrogen-ion activity of a soil. The degree of acidity (or alkalinity) of a soil as determined by means of a glass, quinhydrone, or other suitable electrode or indicator at a specified moisture content or soil-water ratio and expressed in terms of the pH scale. (See reaction, soil.)

PLASTIC SOIL - A soil capable of being molded or deformed continuously and permanently, by relatively moderate pressure, into various shapes.

POROSITY - The volume percentage of the total bulk not occupied by solid particles.

PUMICE - An excessively cellular, light-colored, volcanic ejecta. A sort of volcanic froth. It is very light and will float on water.

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

REACTION, SOIL - The degree of acidity or alkalinity of a soil, usually expressed as a pH value. Descriptive terms commonly associated with certain ranges in pH are; extremely acid, less than 4.5; very strongly acid, 4.5 - 5.0; strongly acid, 5.1 - 5.5; moderately acid, 5.6-6.0;

slightly acid, 6.1 - 6.5; neutral, 6.6 - 7.3; slightly alkaline, 7.4 - 7.8; moderately alkaline, 7.9 - 8.4; strongly alkaline, 8.5 - 9.0; and very strongly alkaline, greater than 9.1.

RESIDUUM - Soil material formed by rock weathering in place.

RIVERWASH - Barren alluvial land, usually coarse-textured, exposed along streams at low water and subject to shifting during normal high water. A miscellaneous landtype.

RUNOFF - That part of the precipitation which appears in surface streams of either perennial or intermittent form.

SAND - A soil separate between .05 and 2.0 mm in diameter.

SANDSTONE - A hard rock composed primarily of cemented sand-size grains.

SCARP - An escarpment, cliff, or steep slopes of some extent along the margin of a plateau, mesa, terrace, or bench.

SEDIMENTARY ROCK - Rock formed by deposition of soil and rock particles by water, ice, or wind that later solidifies through cementation, ionic exchange, or compression.

SHALE - Fine-grained rock, softer than slate, consisting of clay minerals and silt, which characteristically splits readily along closely-spaced planes, parallel to stratification.

SILT - A soil separate consisting of particles between 0.002 and 0.05 millimeters in diameter.

SILTSTONE - A sedimentary rock consisting primarily of silt-size particles.

SLATE - Rock formed by the metamorphism of shale. Slate is very fine-grained and exceptionally well-foliated. Because of its excellent foliation, it splits into thin sheets parallel to stratification.

SLOPE CLASSES - Terms to indicate relative range of slope gradients.

Gentle - Less than 15%
Moderately steep - 15 to 30%
Steep - 30 to 50%
Very steep - Greater than 50%

this has been changed

SLUMP - A deep-seated, slow-moving, rotational failure occurring in plastic materials, resulting in vertical and lateral displacement.

SOIL - Any and all loose, unconsolidated, weathered material on the earth's surface resting on solid, consolidated, unweathered bedrock, regardless of origin, mode of formation, or type of weathering or deposition. Generally includes any material that may be manipulated by hand tools or heavy equipment without the need of blasting except soft, unweathered bedrock. In soil horizon designation, soil materials include "A", "B", and "C" horizons.

SOIL CREEP - Slow mass movement of soil material downslope primarily under the influence of gravity but facilitated by saturation with water and/or by alternating freezing and thawing.

SOIL DEPTH CLASSES - Terms to indicate relative range of soil depth to consolidated, unweathered bedrock.

Very shallow - Less than 10 inches
Shallow - 10 to 20 inches
Moderately deep - 20 to 40 inches
Deep - 40 to 60 inches
Very deep - 60 to 144 inches
Extremely deep - Greater than 144 inches

SOIL LAYER THICKNESS CLASSES - Terms to indicate relative range of soil layer thickness.

Very thin - Less than 6 inches
Thin - 6 to 18 inches
Moderately thick - 18 to 36 inches
Thick - 36 to 72 inches
Very thick - Greater than 72 inches

SOIL SEPARATES - Mineral particles, less than 2.0 mm in equivalent diameter, ranging between specified size limits. The names and size limits of separates recognized in the United States are; very coarse sand, 2.0 to 1.0 mm; coarse sand, 1.0 to 0.5 mm; medium sand, 0.5 to 0.25 mm; fine sand, 0.25 to 0.10 mm; very fine sand, 0.10 to 0.05 mm; silt, 0.05 to 0.002 mm; and clay, less than 0.002 mm.

SOIL TEXTURE - The relative proportions of the various soil separates in a soil as described by the classes of soil texture. The textural classes may be modified by the addition of suitable adjectives when coarse fragments are present in substantial amounts; for example, "stony silt loam" or "silt loam, stony phase". (For other modifications, see coarse fragments.) The sand, loamy sand, and sandy loam are further subdivided on the basis of the proportions of the various sand separates present.

STONY - Used to modify textural classes and identifies that the volume of greater than 10 inch in diameter rock fragments in the soil ranges from 35 to 50 percent; very stony ranges from 50 to 80 percent; and extremely stony exceeds 80 percent.

SUBSOIL LAYERS - The soil materials lying between the surface layers and bedrock. They can include any soil horizon below the A horizon and differs from the surface layers significantly in soil characteristics.

SURFACE LAYERS - The portion of a soil extending from the mineral soil surface down to a layer that differs significantly in soil characteristics. These layers can include the A, B, or C horizons. Example: A soil profile including a weak A, AC, and C horizon development in a sandy loam volcanic ash layer, 50 inches thick, overlying bedrock is considered as a surface layer.

TOESLOPE - Portion of a slope that is transitioned between the valley floor and the upper slope.

TOPOGRAPHY - The relief features or surface configuration of an area.

TOPSOIL - (1) Earthy material used as top-dressing for house lots, grounds for large buildings, gardens, road cuts, or similar areas. It has favorable characteristics for production of desired kinds of vegetation or can be made favorable. (2) The surface plow layer of a soil. Syn. surface soil. (3) The original or present A horizon, varying widely among different kinds of soil. Applied to soils in the field, the term has no precise meaning unless defined as to depth or productivity in relation to a specific kind of soil.

TUFFS - Rocks composed of cemented fine textured (ash) volcanic material.

UNIFIED SOIL CLASSIFICATION SYSTEM (ENGINEERING) - A classification system based on the identification of soils according to their particle size, gradation, plasticity index, and liquid limit.

VOLCANIC SEDIMENTS - Consolidated rock material containing abundant volcanic debris.

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LANDTYPE MAPS

MAP LEGEND

SOIL RESOURCE INVENTORY MAPS U.S.F.S. R-6 - 1977

Soil mapping by U.S.F.S. Pacific Northwest Region. Soil Scientists - Dale Paulson, Garwin Carlson and Earle Rother. Landtype mapping unit descriptions and interpretations are located in the Soil Resource Inventory Report. Map bases are U.S.G.S. and U.S. Forest Service. 1" =1 mile scale

Examples of mapping unit symbols:

⊙	Modal site locations
T2	A single land type
T2B T26	A complex of land types

Planimetric Base Symbol Legend

ROAD CLASSIFICATION

HEAVY DUTY ALL WEATHER

Paved Road

Rock Surface Road

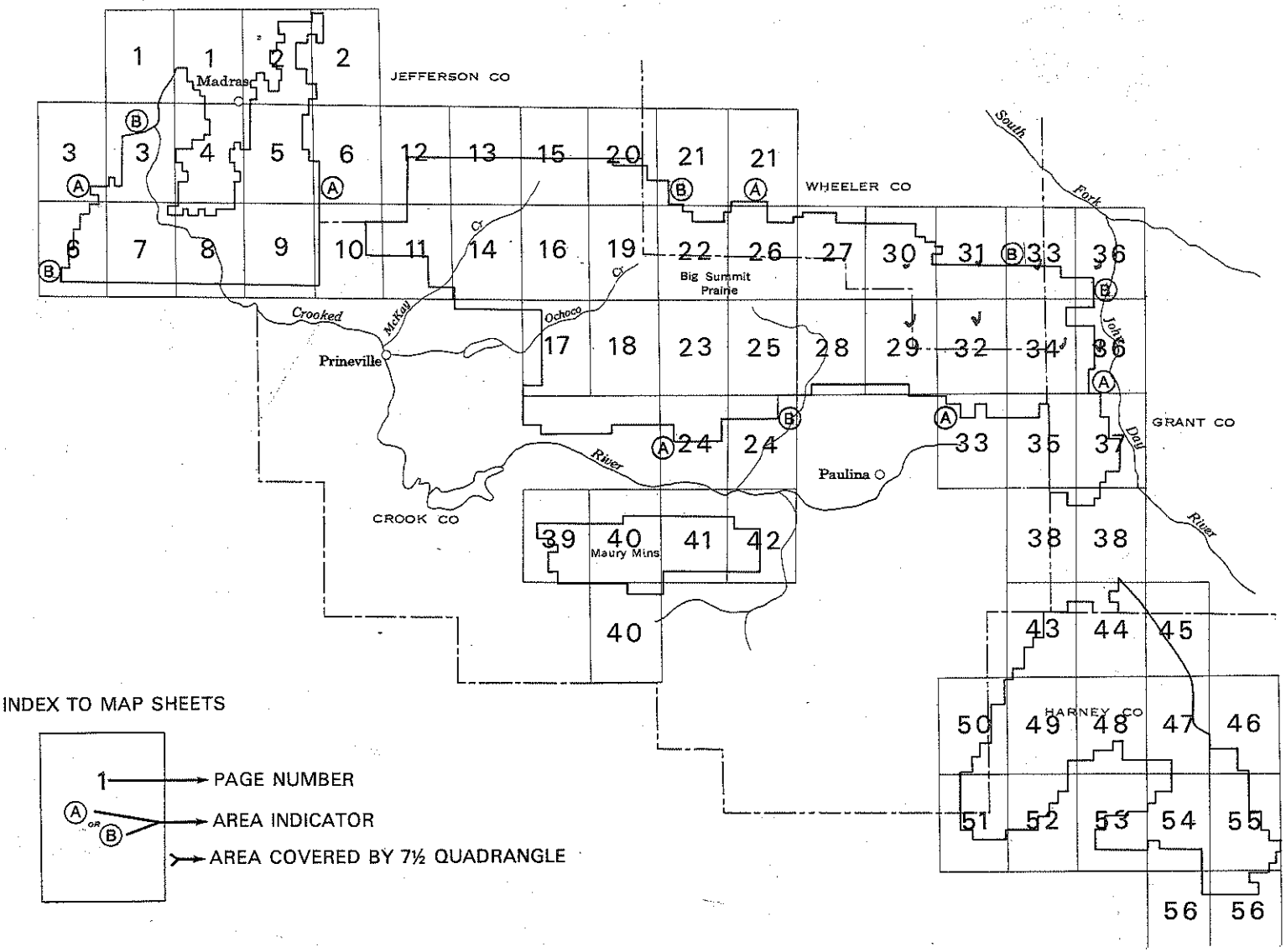
U. S. Route

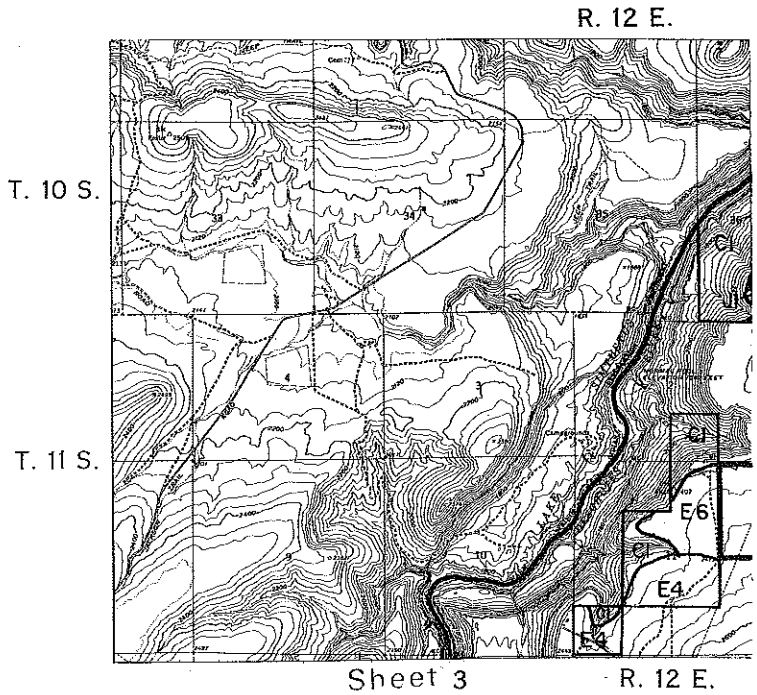
DRY WEATHER

Dirt Road

Primitive Road

State Route


JEFFERSON CO
Madras
WHEELER CO
Big Summit Prairie
Prineville
Crooked
McKay
Ochoco
Ck
South Fork
John Day
River
GRANT CO
Paulina
CROOK CO
Maury Mins
HARNEY CO
INDEX TO MAP SHEETS
1 → PAGE NUMBER
A or B → AREA INDICATOR
→ AREA COVERED BY 7½ QUADRANGLE



Seekseequa Junction Quadrangle
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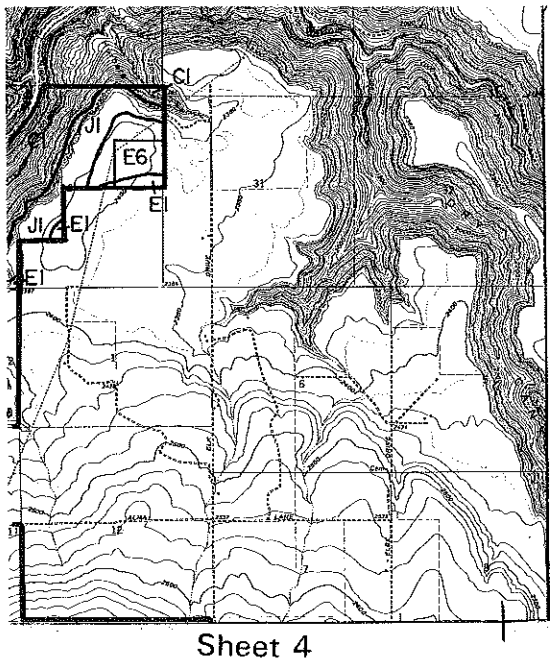
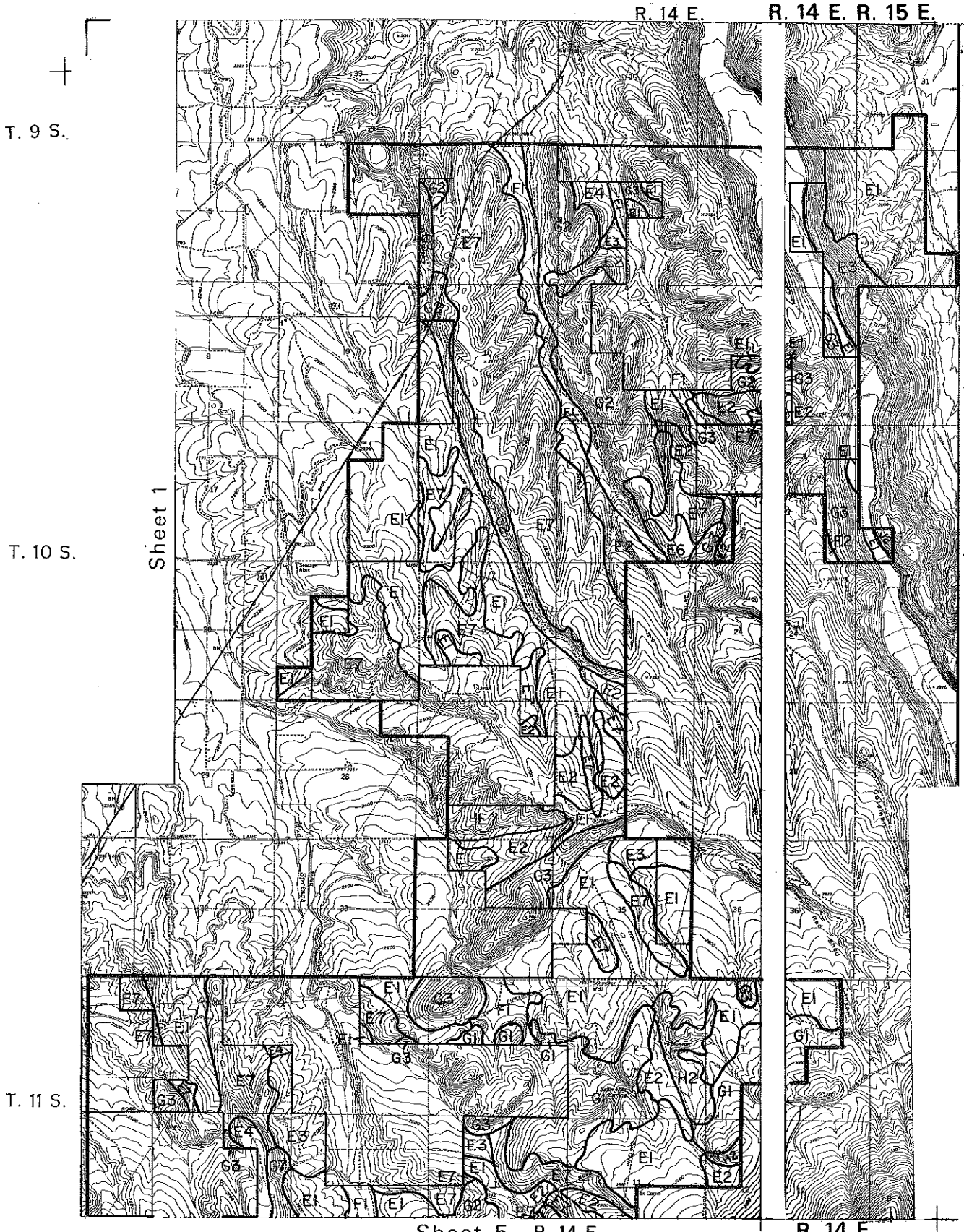
Contour Interval 40 ft.

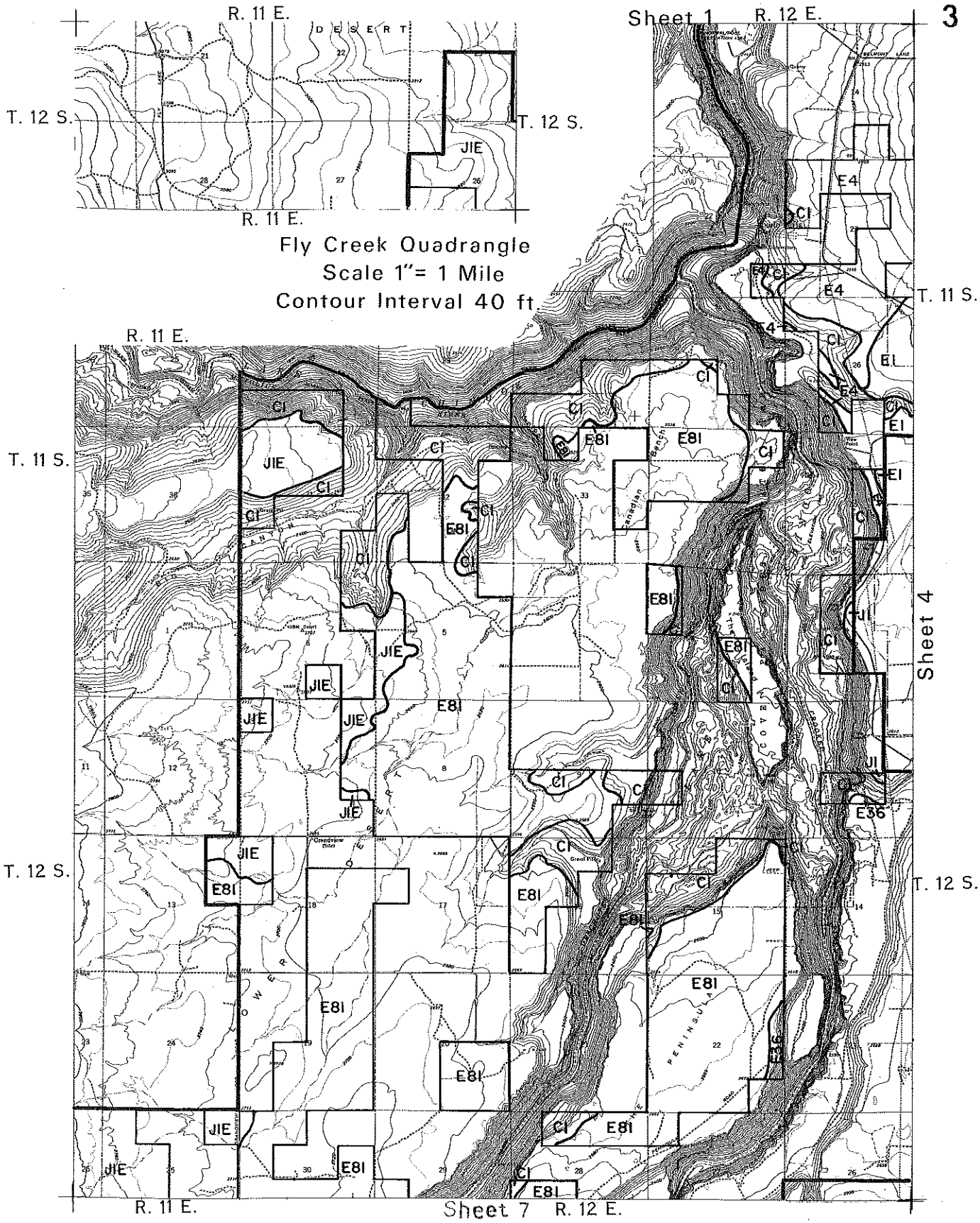


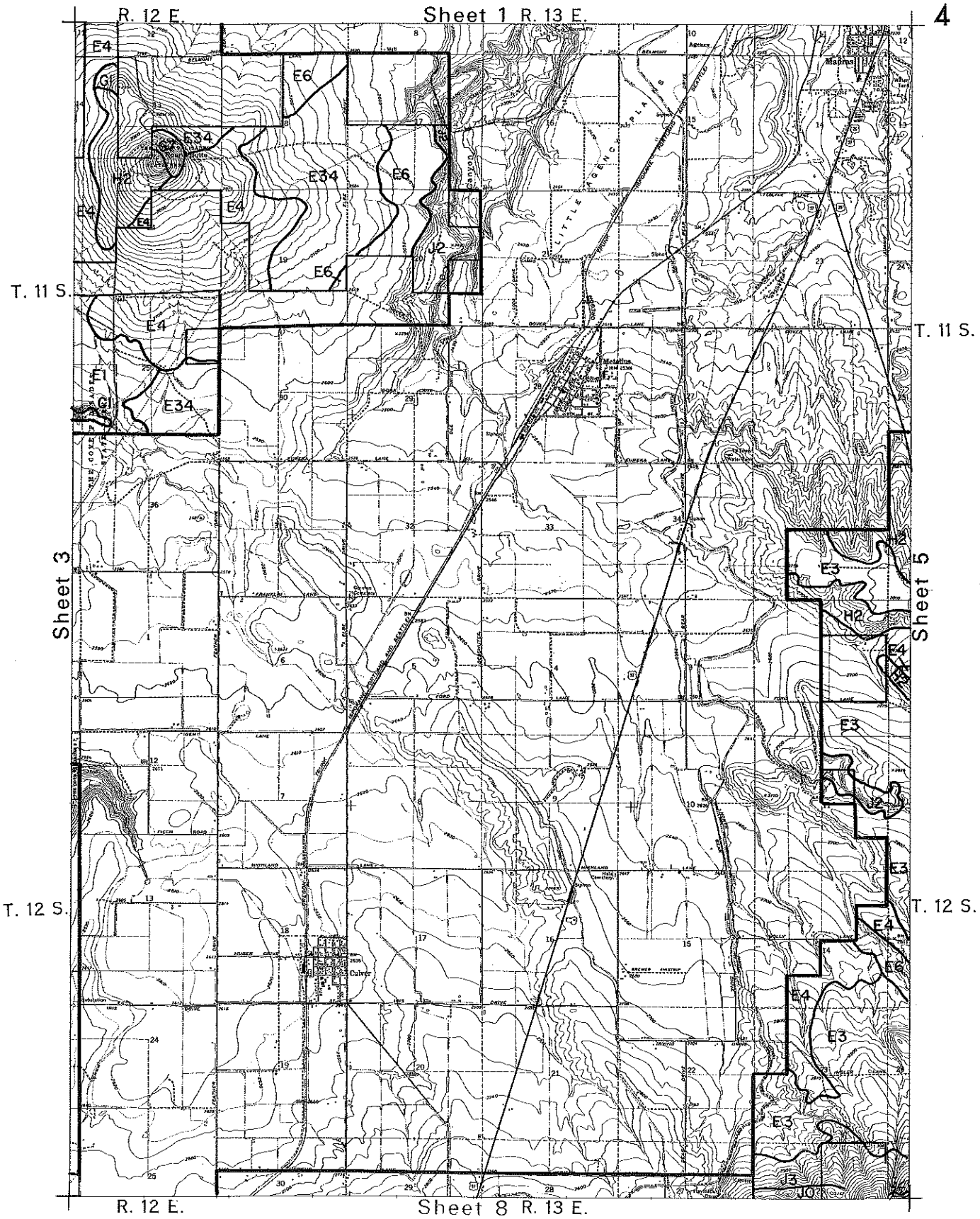
Madras West Quadrangle
Scale 1"=1Mile
Contour Interval 20 ft.



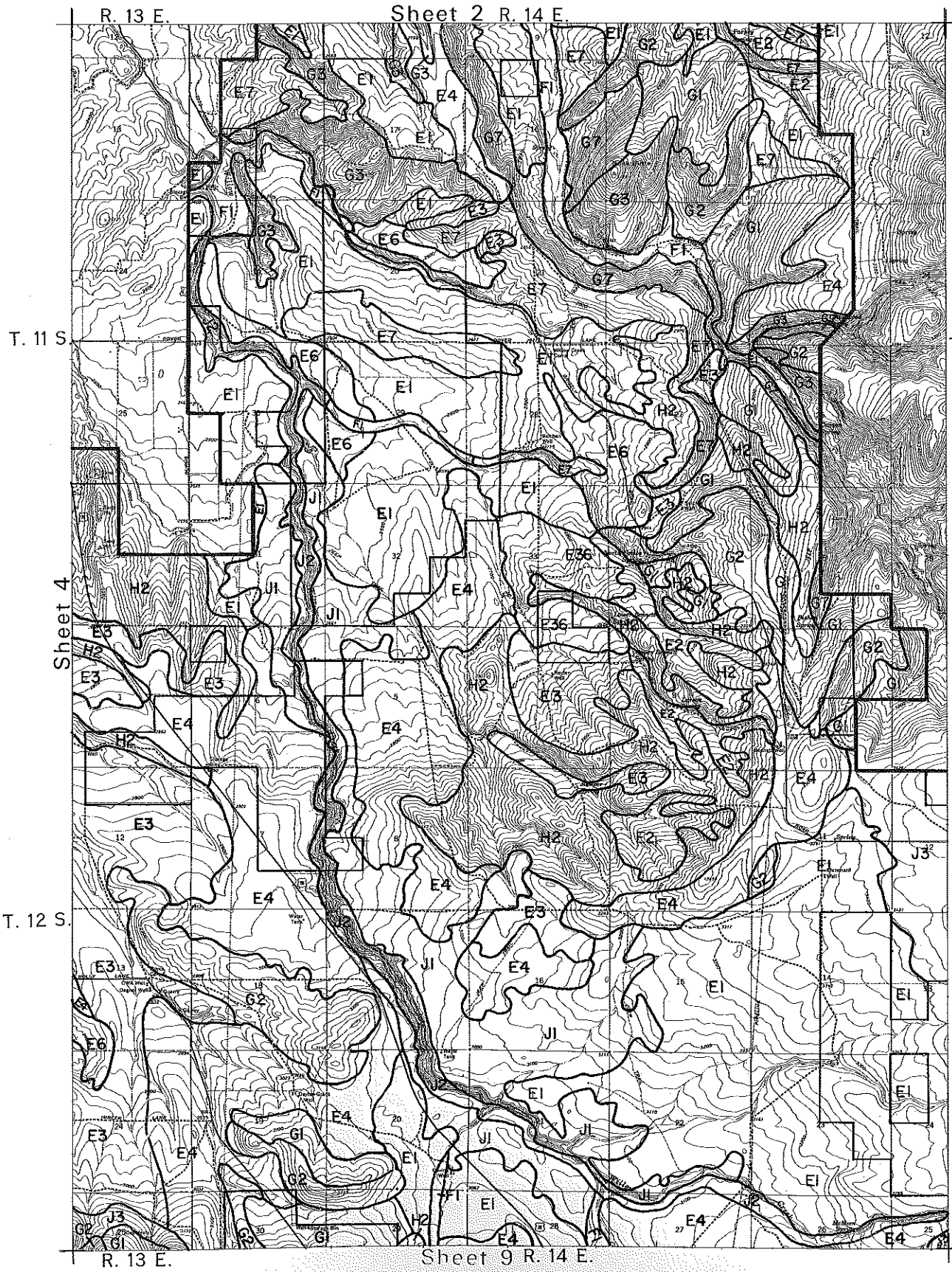
Madras East Quadrangle
Scale 1"=1Mile
Contour Interval 20 ft.

Teller Butte Quadrangle
Scale 1"=1 Mile
Contour Interval 20 ft.

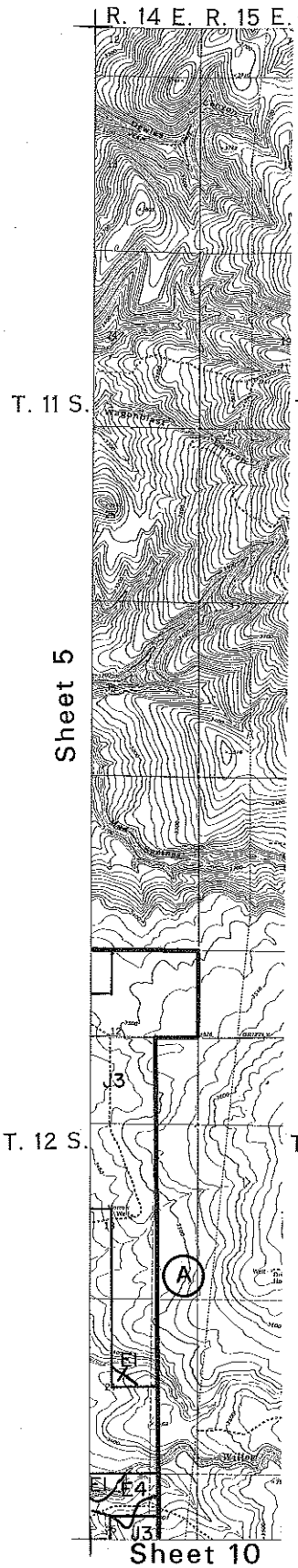

R. 11 E.
R. 12 E.
T. 12 S.
T. 11 S.
Sheet 1
Sheet 4
Sheet 7
DESERT
JIE
E81
E4
E36
CI
EI
JI
Fly Creek Quadrangle
Scale 1"= 1 Mile
Contour Interval 40 ft.
Round Butte Dam Quadrangle
Scale 1"=1 Mile
Contour Interval 40 ft.



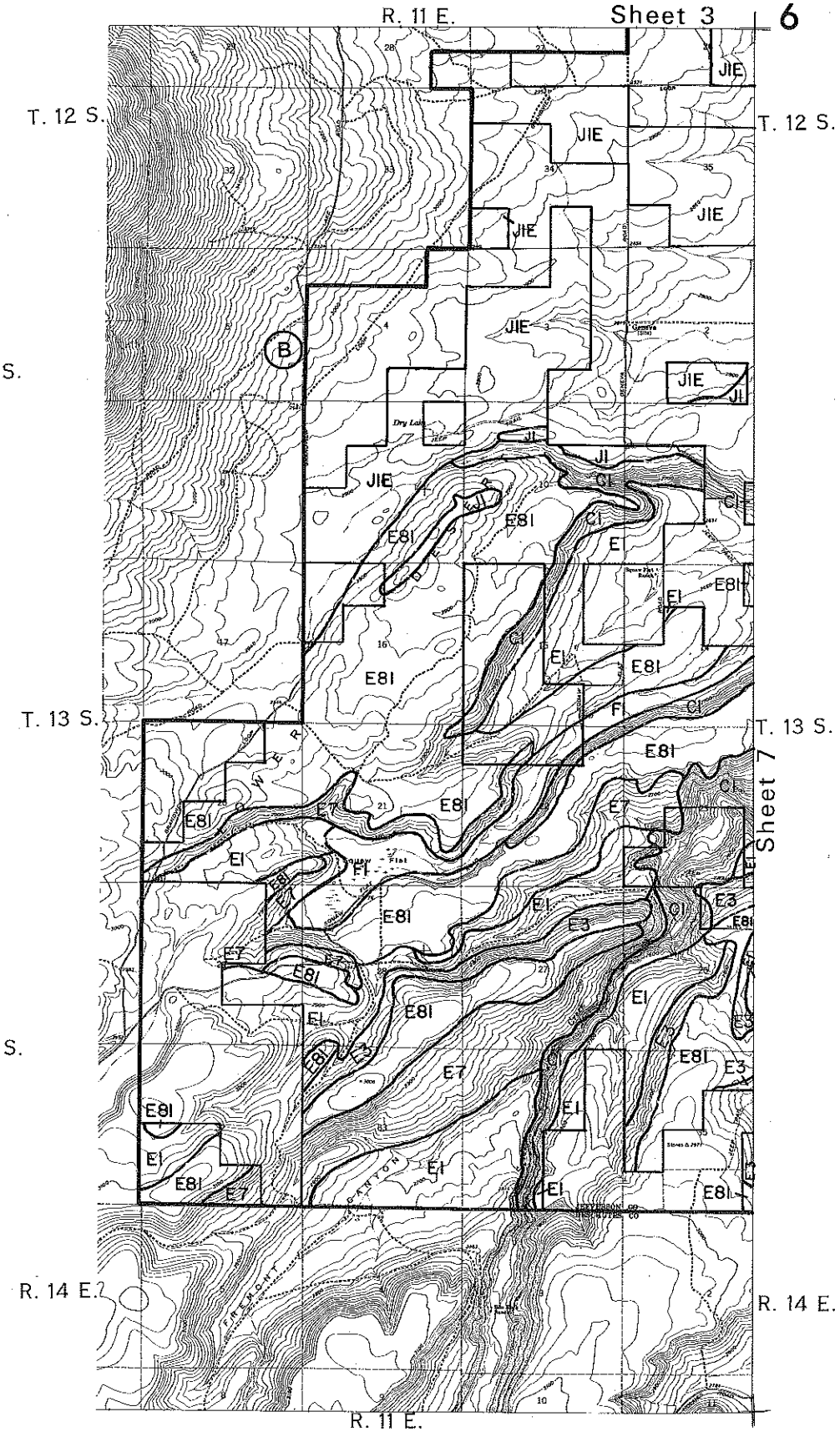
Culver Quadrangle
Scale 1"=1 Mile
Contour Interval 20 ft.



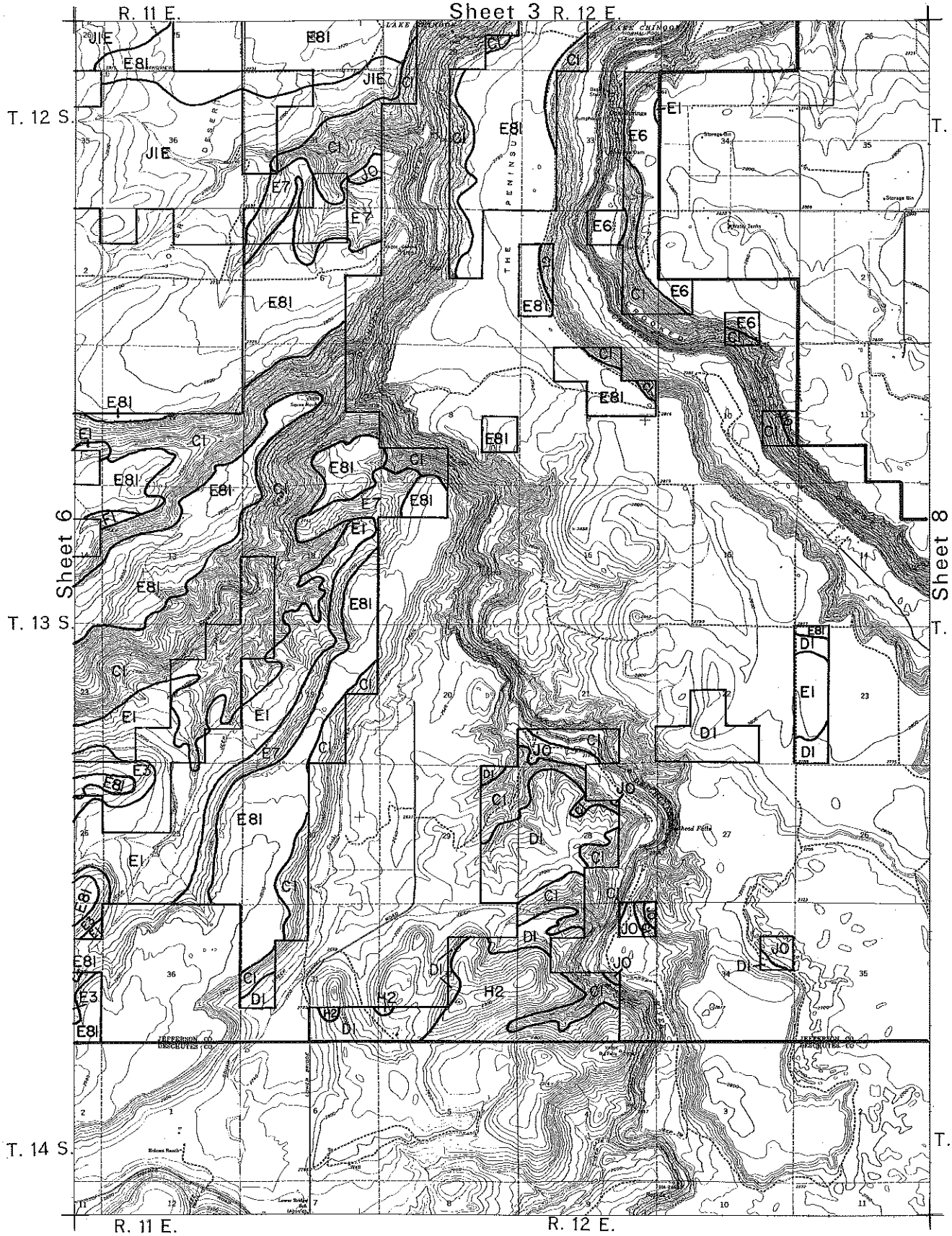
Buck Butte Quadrangle
Scale 1"=1Mile
Contour Interval 20 ft.



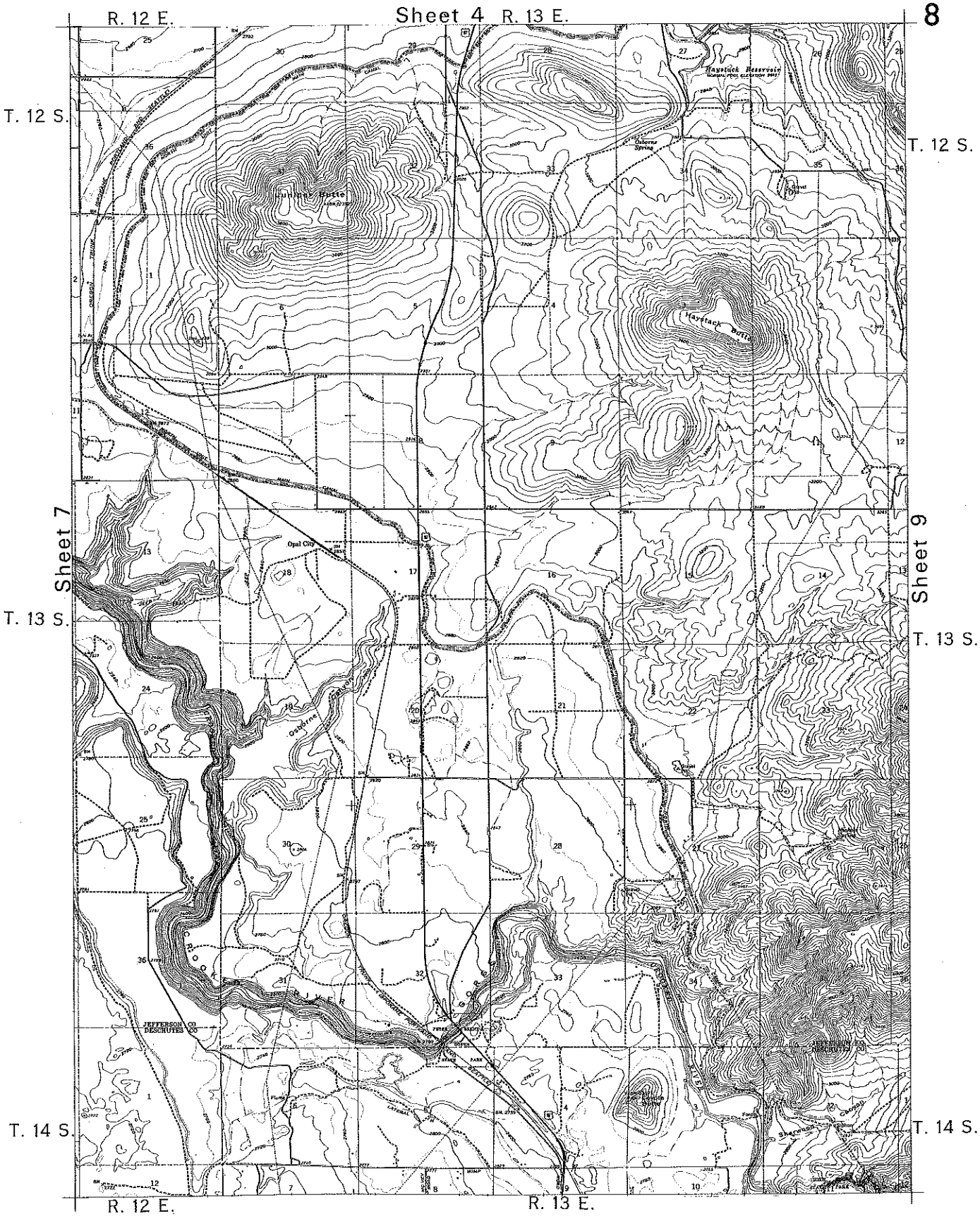
R. 14 E. R. 15 E.
Brewer Reservoir Quadrangle
Scale 1"=1 Mile
Contour Interval 20 ft.



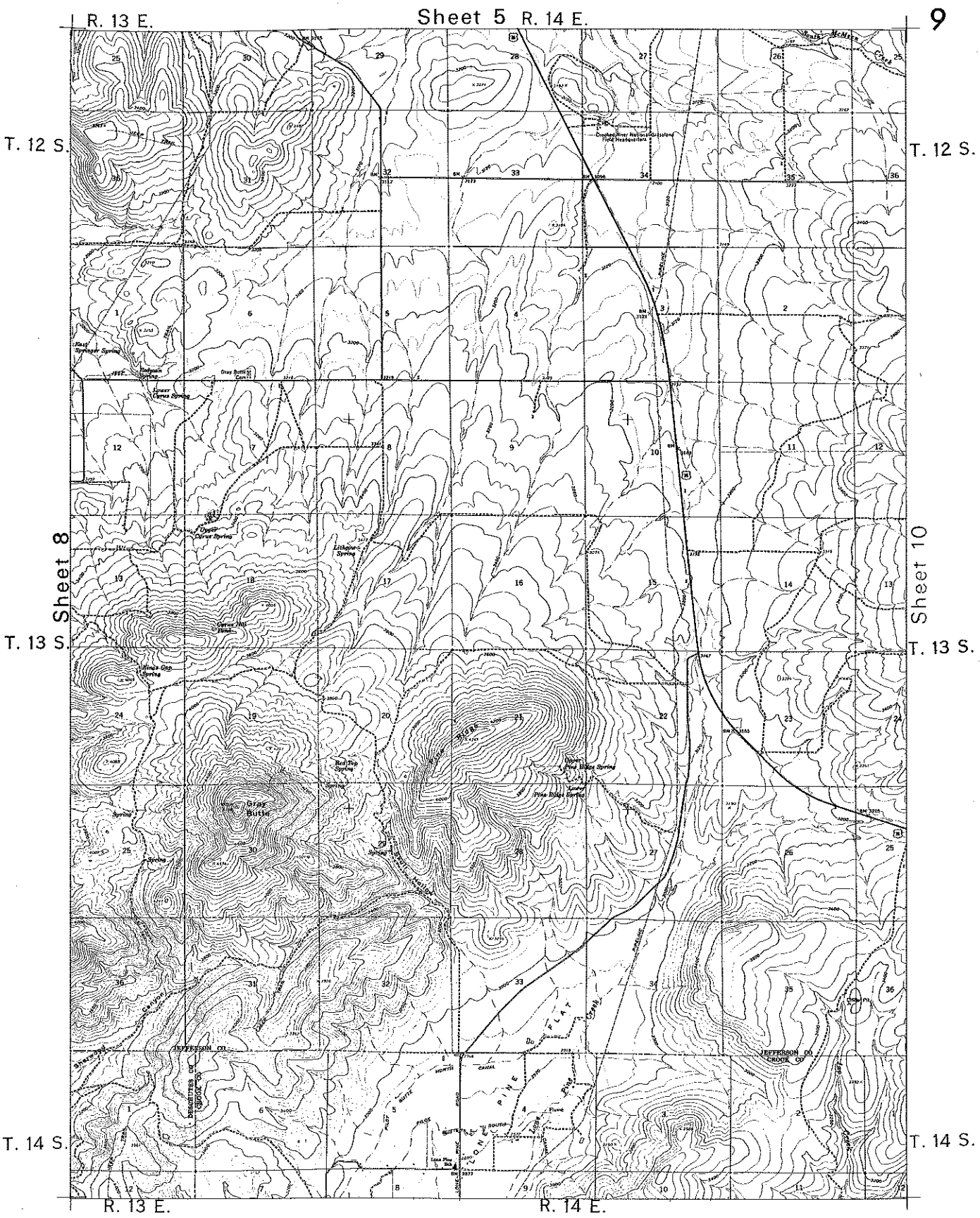
R. 11 E.
Squaw Back Ridge Quadrangle
Scale 1"=1Mile
Contour Interval 20 ft.



Steelhead Falls Quadrangle
Scale 1"=1 Mile
Contour Interval 20 ft.

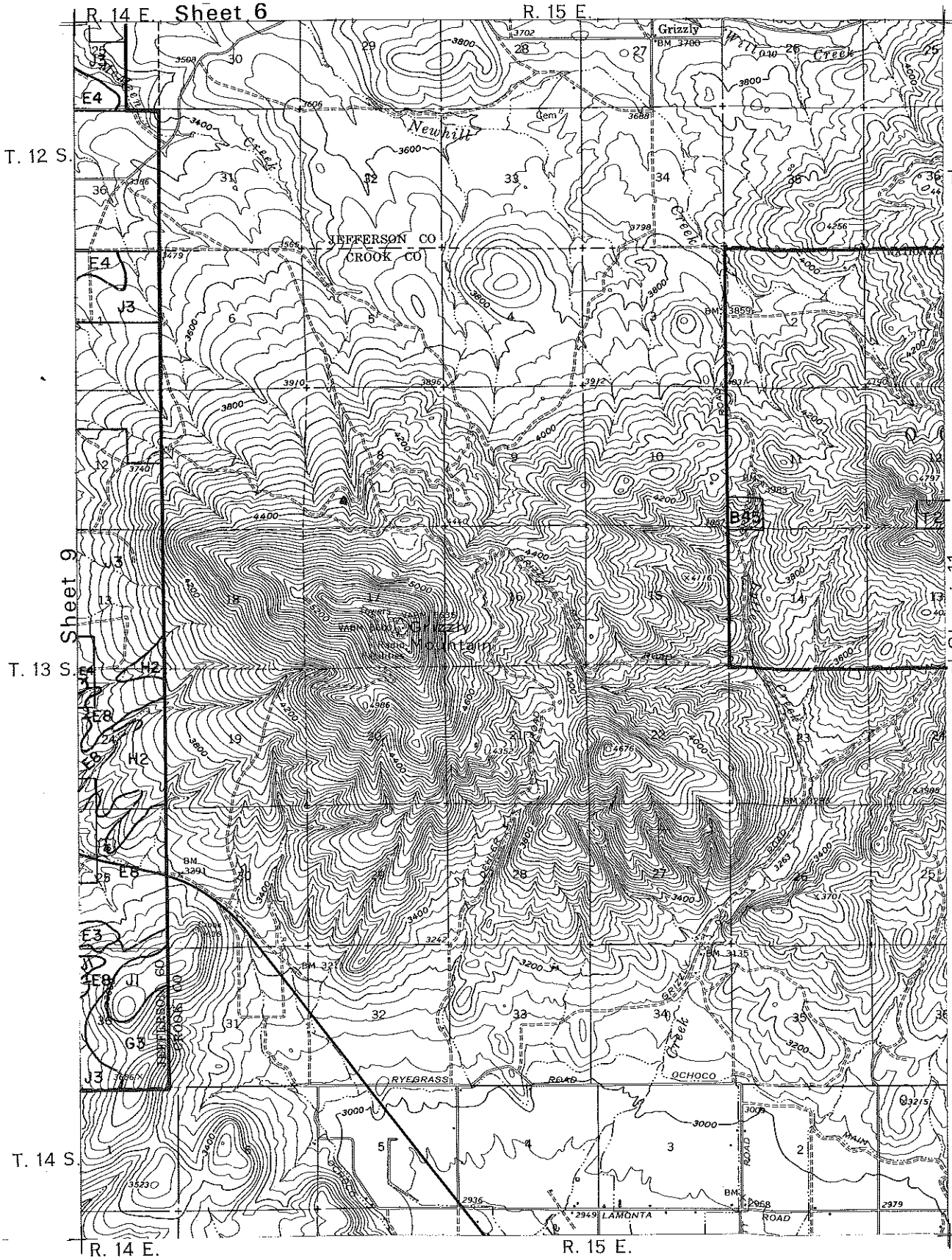


Opal City Quadrangle
Scale 1″=1 Mile
Contour Interval 40 ft.

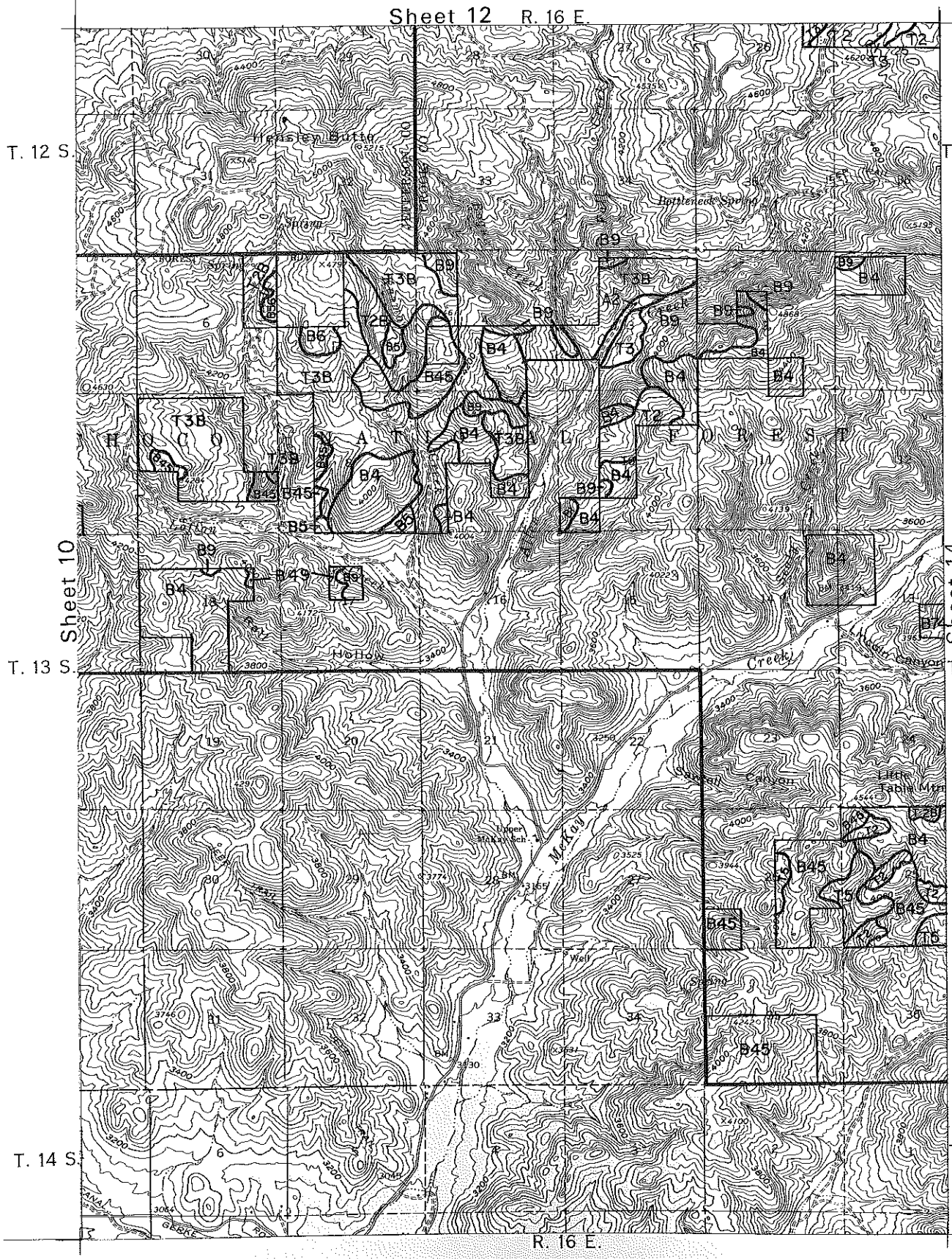


Gray Butte Quadrangle
Scale 1"=1 Mile
Contour Interval 40 ft.

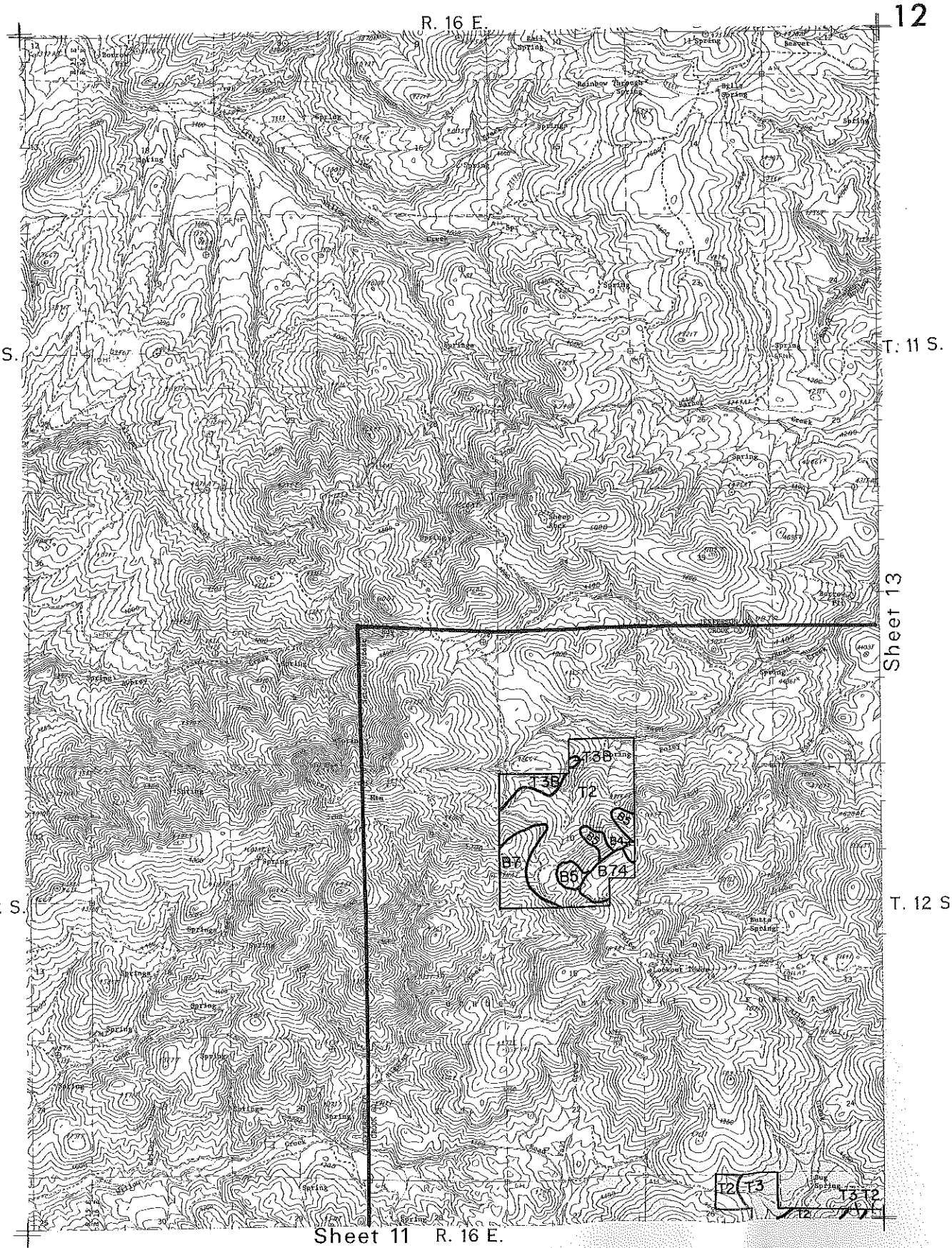
PRINEVILLE N.W. 1/4 (297)



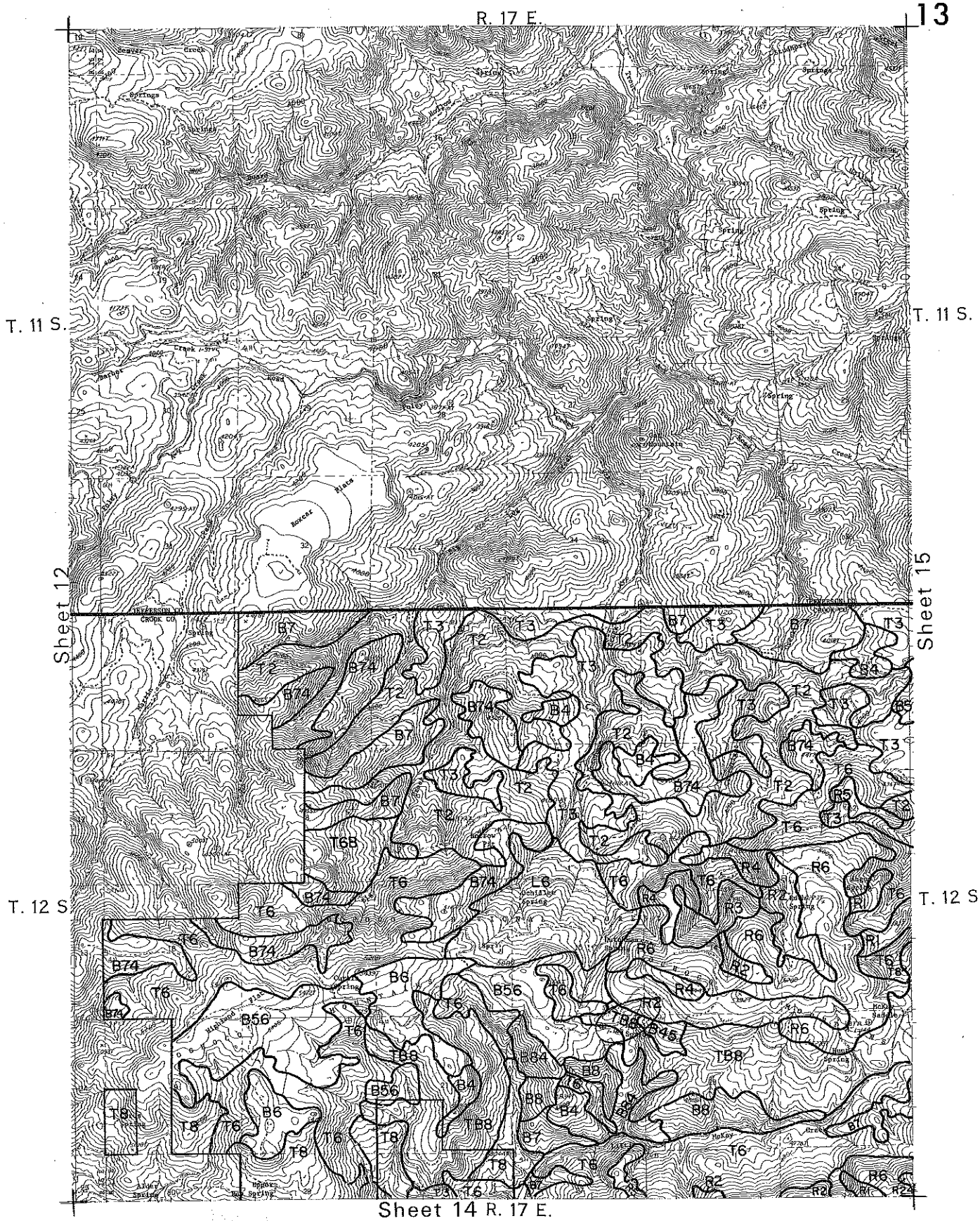
NW Prineville Quadrangle
Scale 1"= 1 Mile
Contour Interval 40 ft.



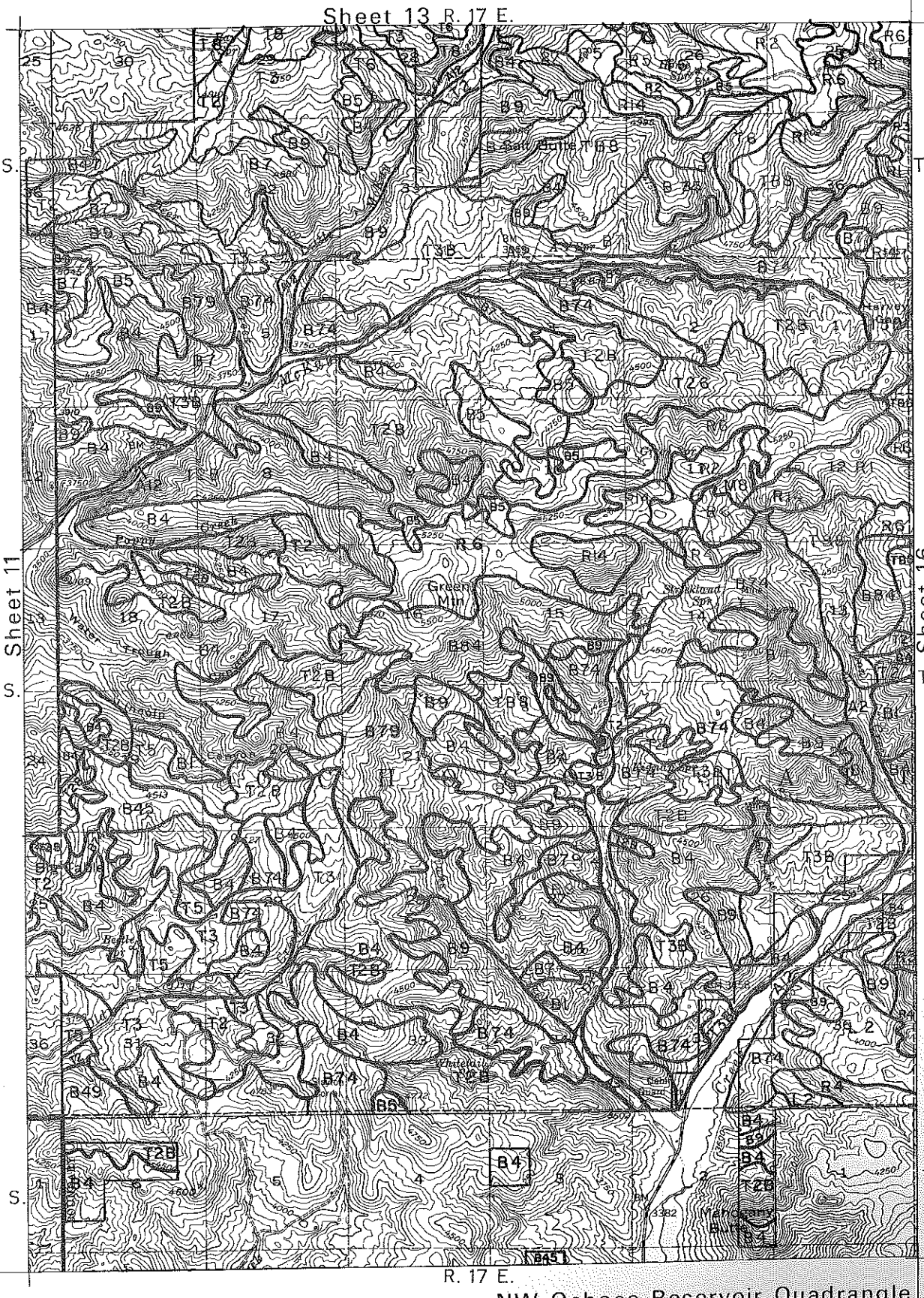
NE Prineville Quadrangle
Scale 1"=1 Mile
Contour Interval 40 ft.



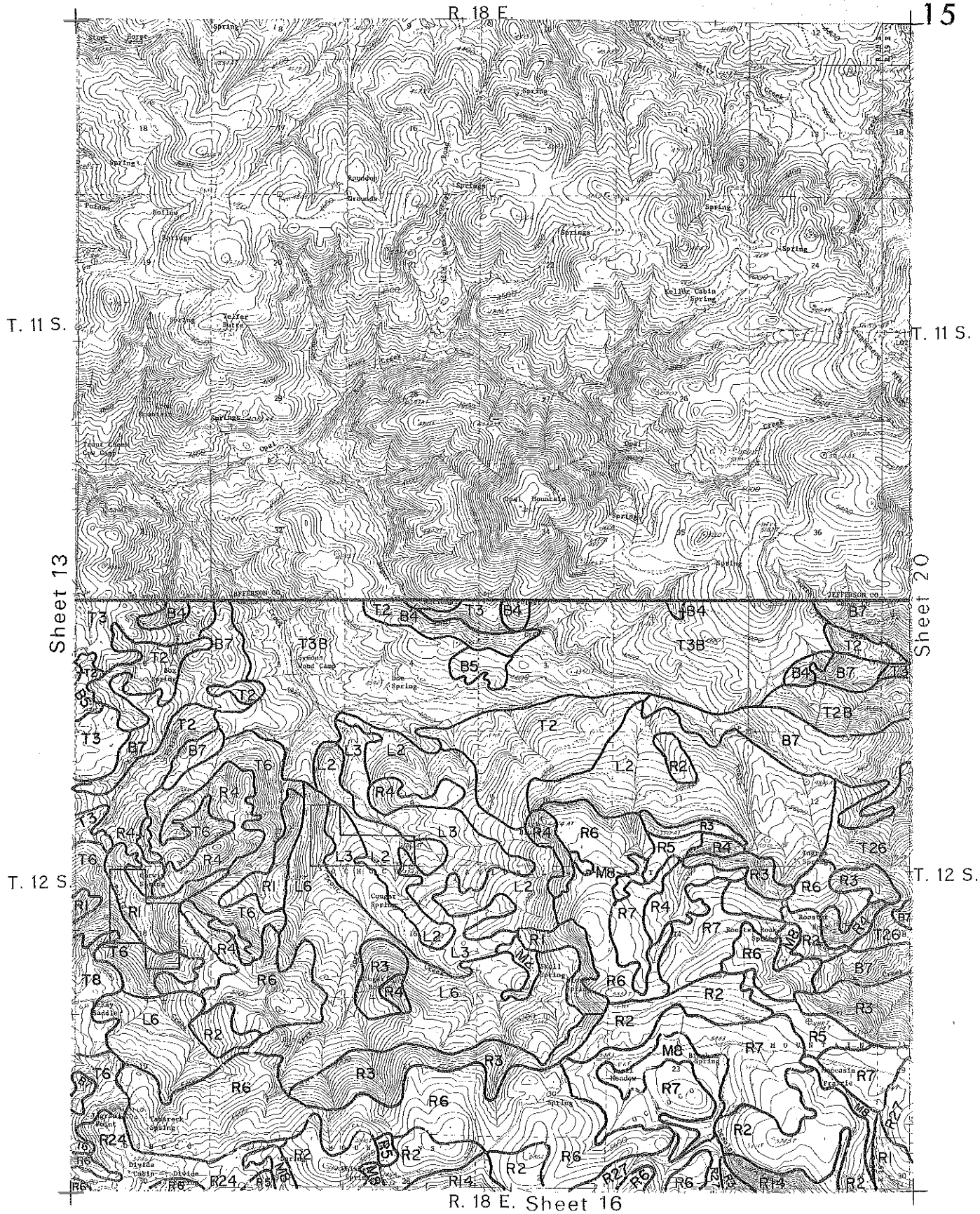
Foley Butte Quadrangle
Scale 1"=1 Mile
Contour Interval 40 ft.



Dutchman Creek Quadrangle
Scale 1"=1 Mile
Contour Interval 40 ft.



NW Ochoco Reservoir Quadrangle
Scale 1"=1 Mile
Contour Interval 50 ft.

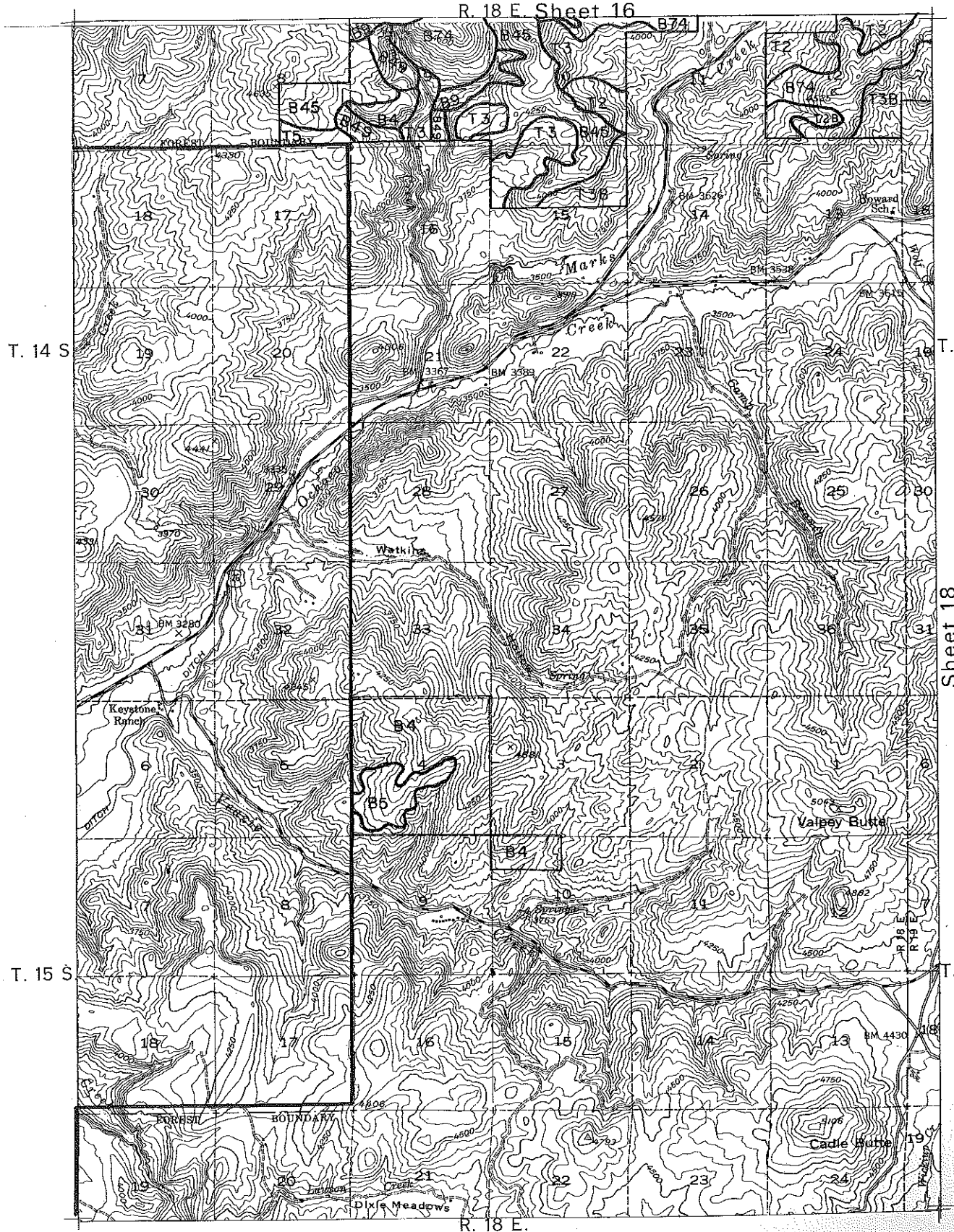


Opal Mtn. Quadrangle
Scale 1"= 1 Mile
Contour Interval 40 ft.

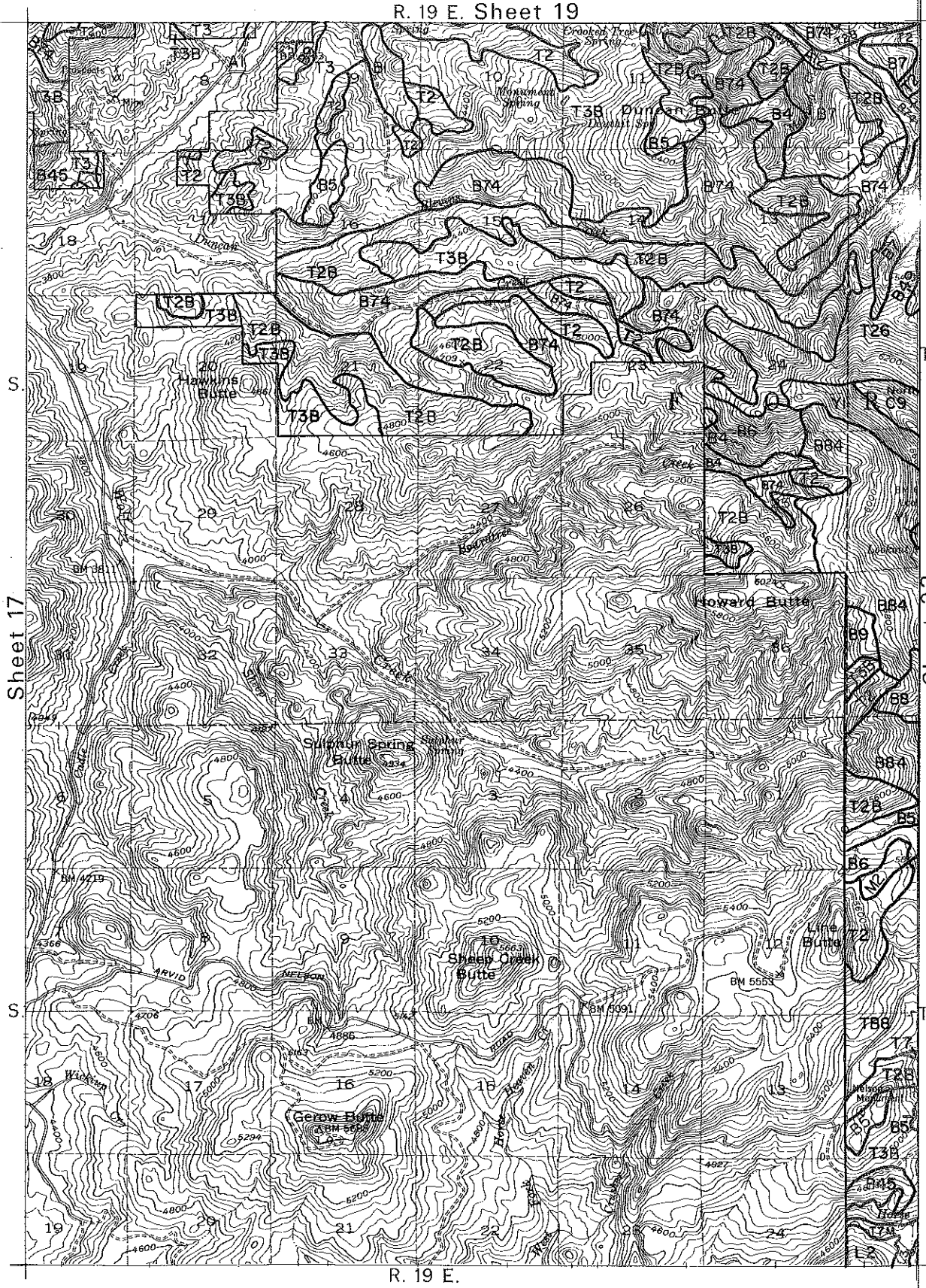
R. 18 E. Sheet 15

R. 18 E. Sheet 17

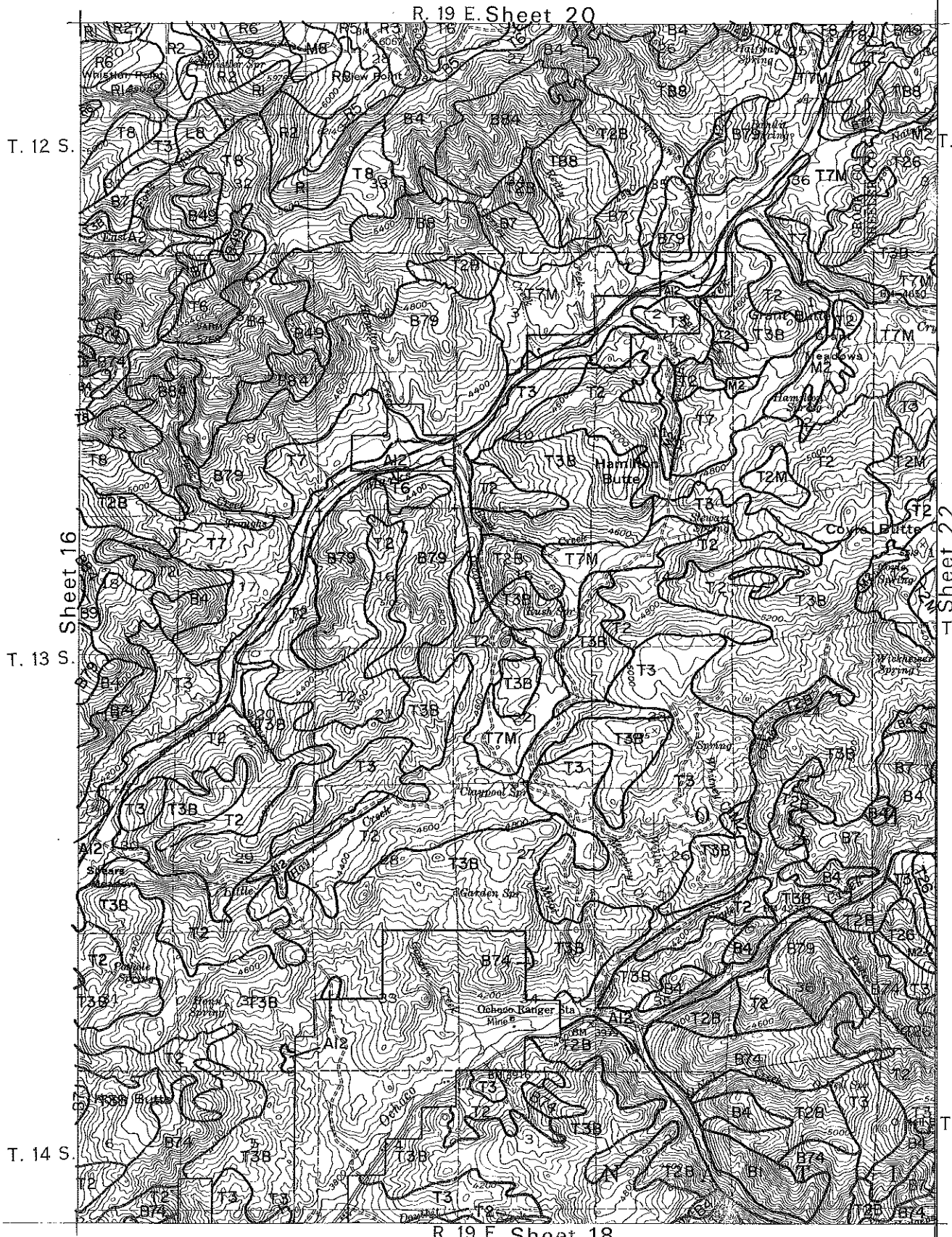
NE Ochoco Reservoir Quadrangle
Scale 1"=1 Mile
Contour Interval 50 ft.



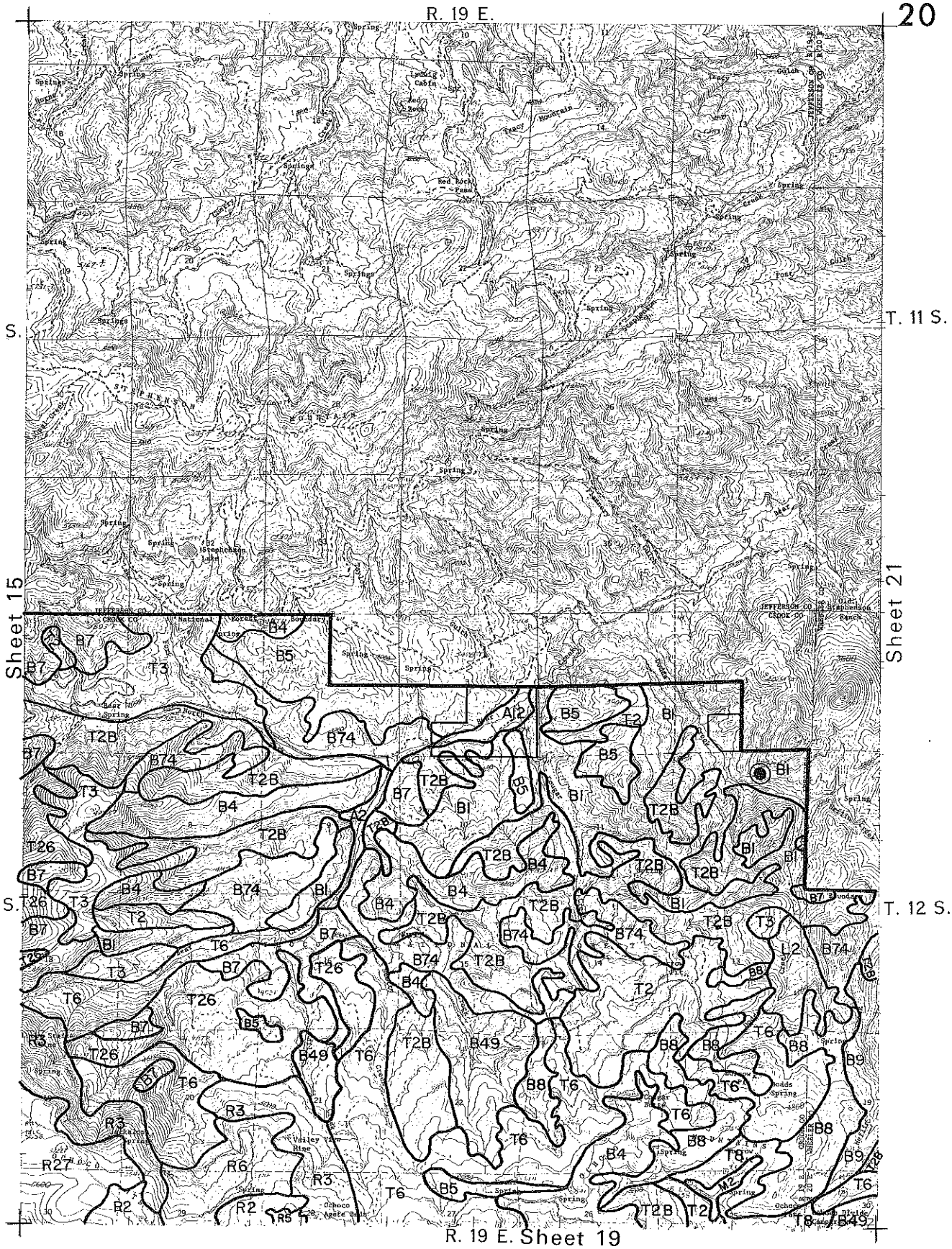
SE Ochoco Reservoir Quadrangle
Scale 1"=1 Mile
Contour Interval 50 ft.



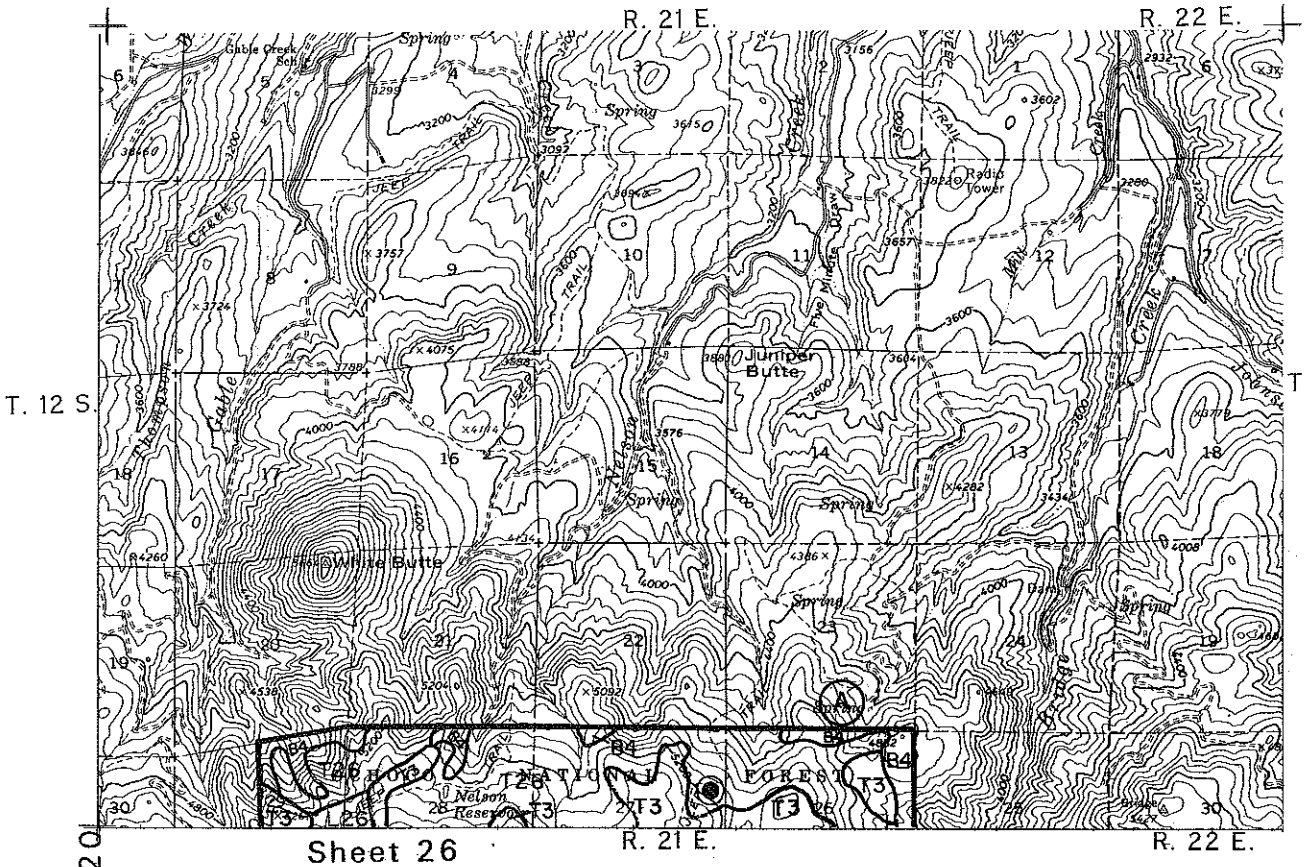
SW Lookout Mtn. Quadrangle
Scale 1"=1 Mile
Contour Interval 40 ft.



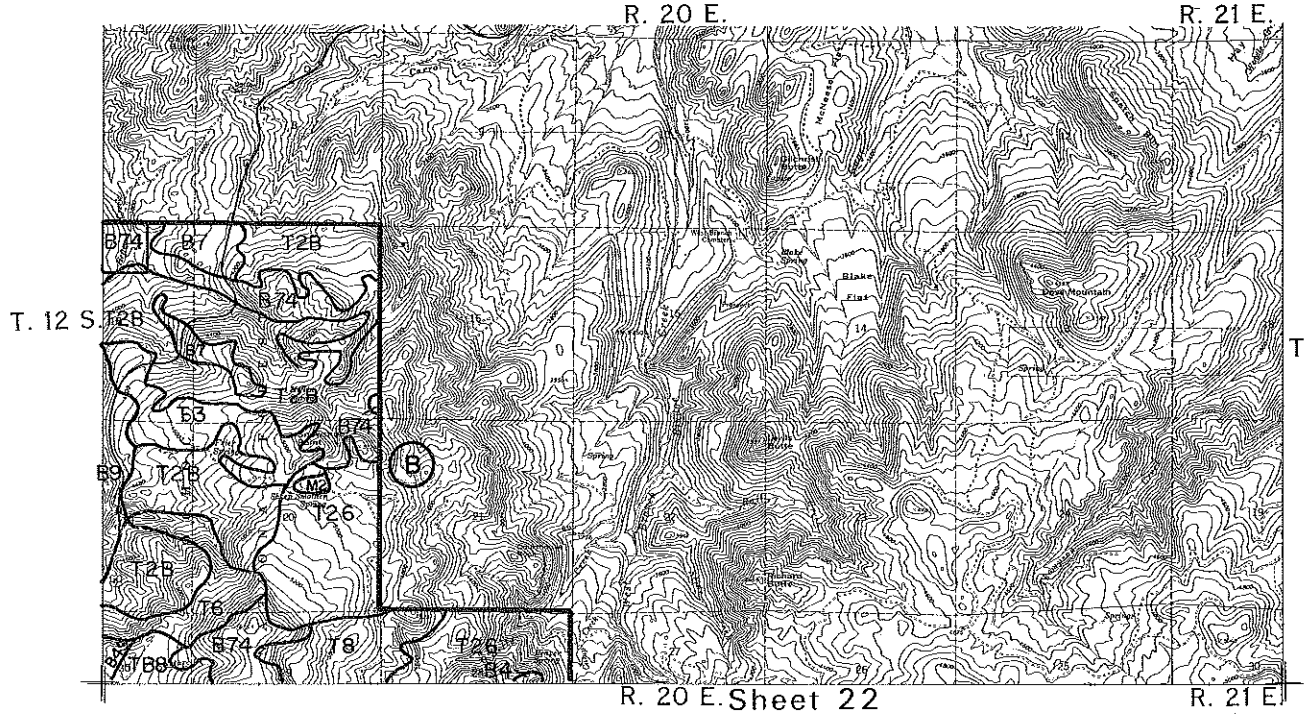
NW Lookout Mtn. Quadrangle
Scale 1"=1 Mile
Contour Interval 40 ft.



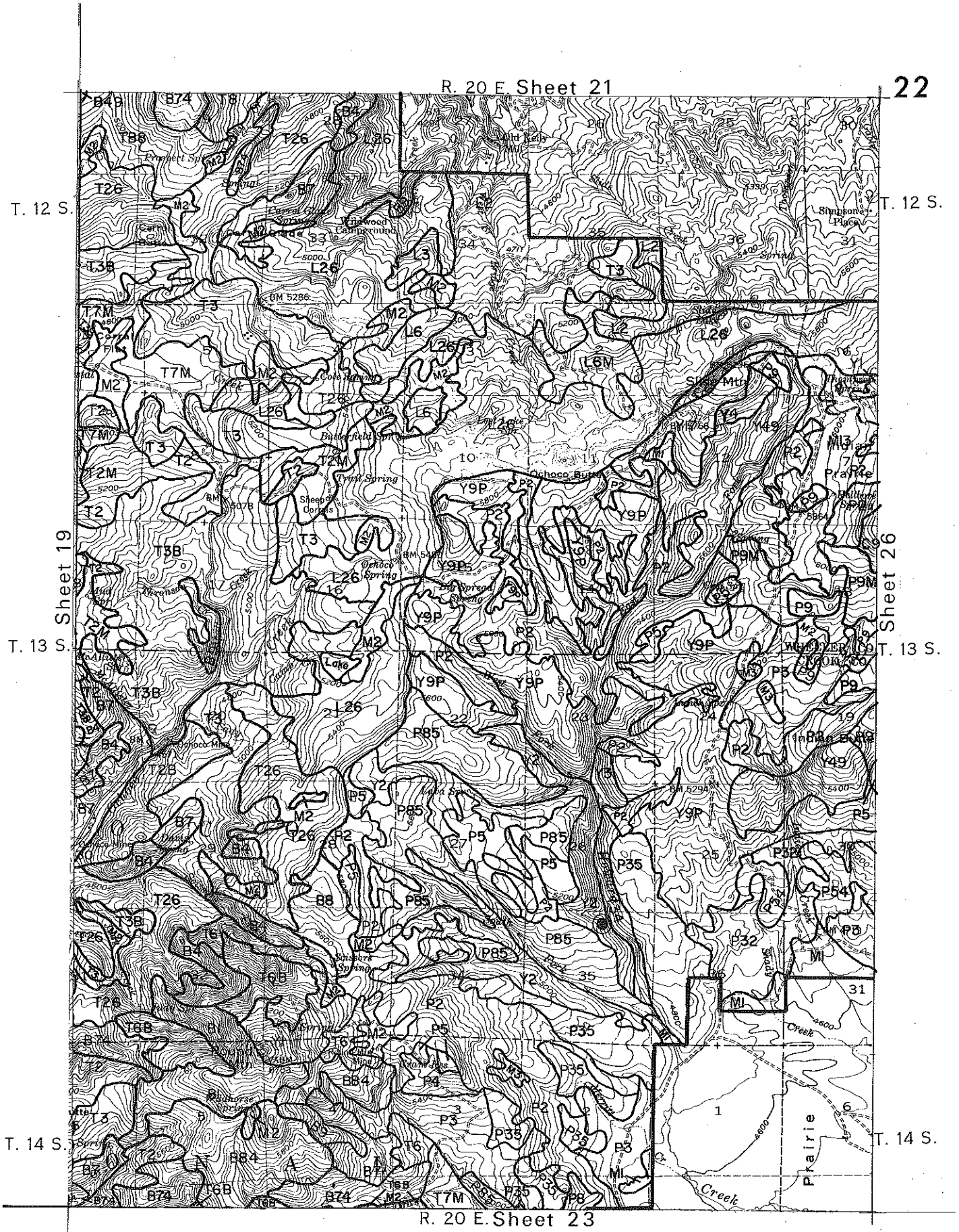
Stephenson Mtn. Quadrangle
Scale 1″=1 Mile
Contour Interval 40 ft.



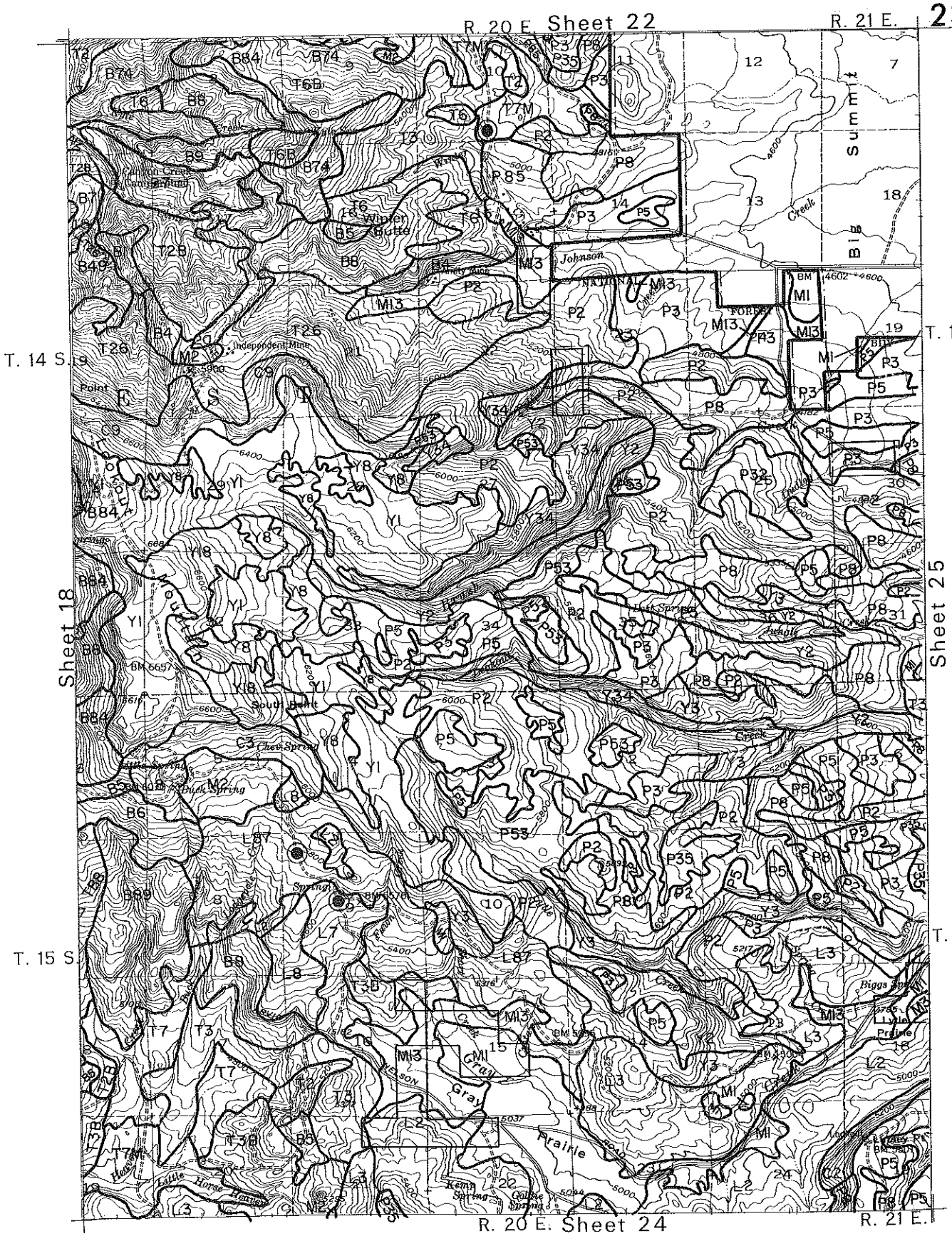
SW Mitchell Quadrangle
Scale 1"=1 Mile
Contour Interval 80 ft.



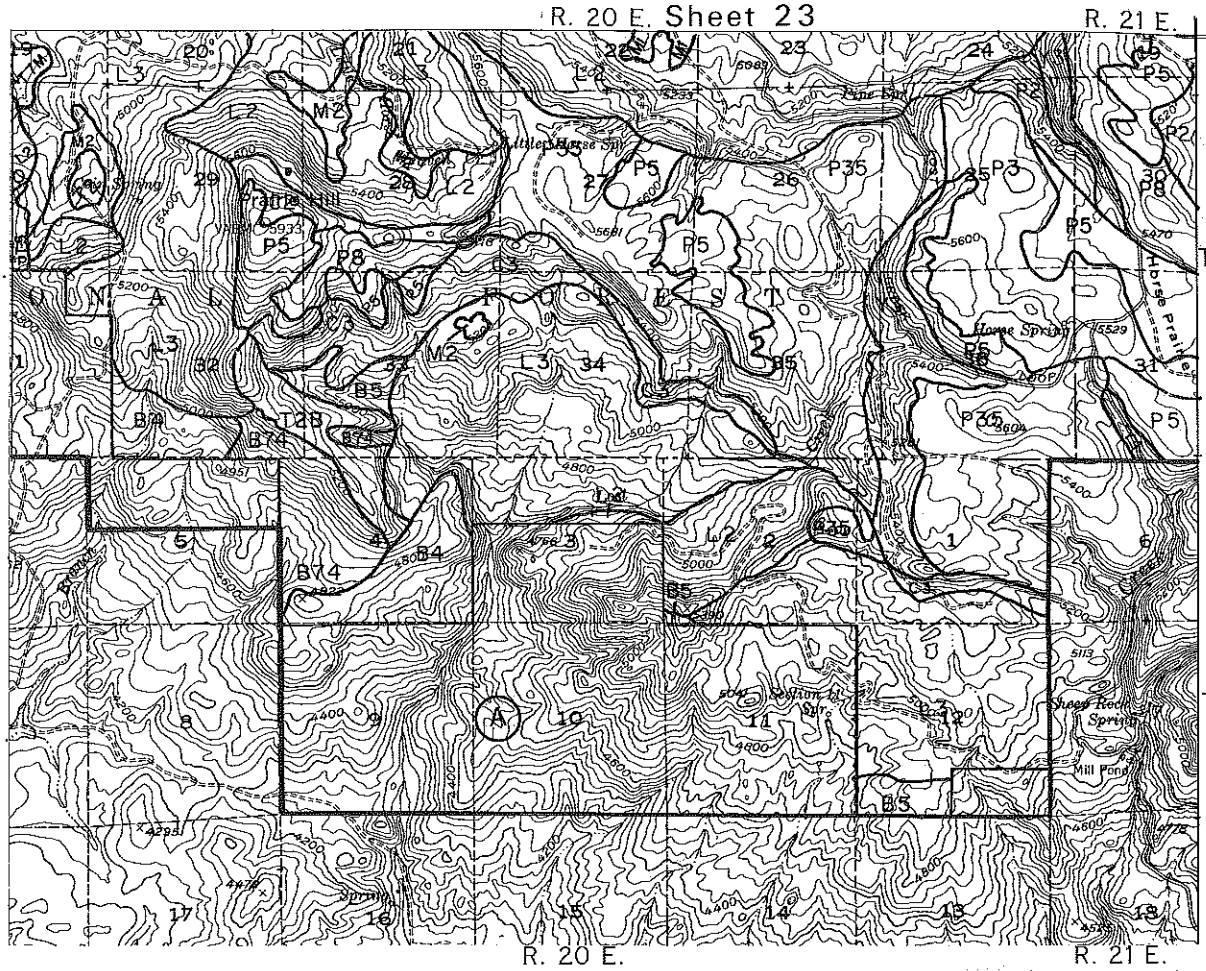
Lawson Mtn. Quadrangle
Scale 1"= 1 Mile
Contour Interval 40 ft.



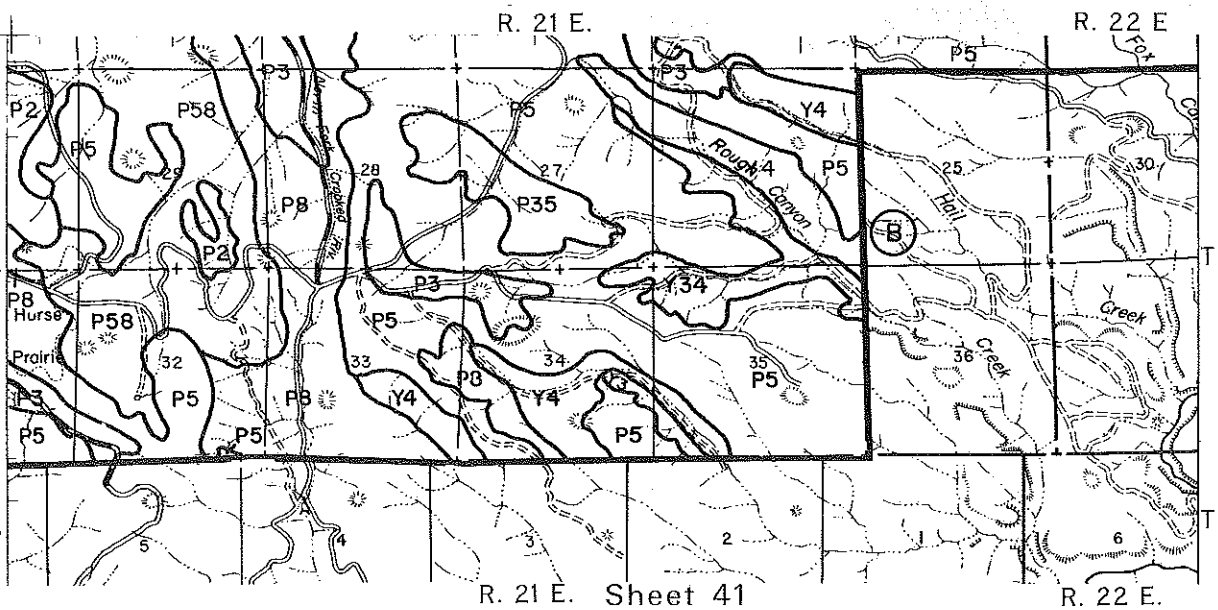
NE Lookout Mtn. Quadrangle
Scale 1"=1 Mile
Contour Interval 40 ft.



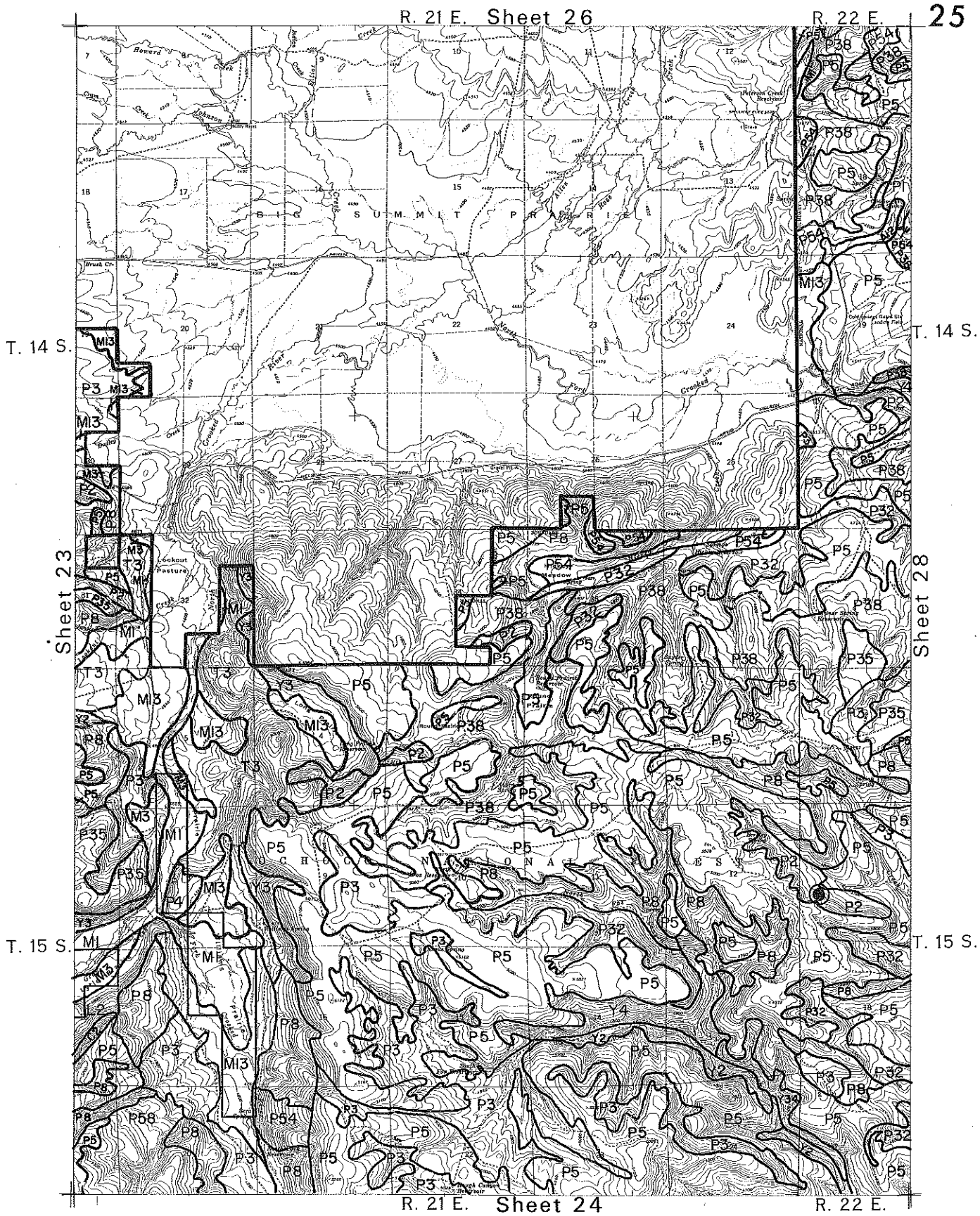
SE Lookout Mtn. Quadrangle
Scale 1"=1 Mile
Contour Interval 40 ft.



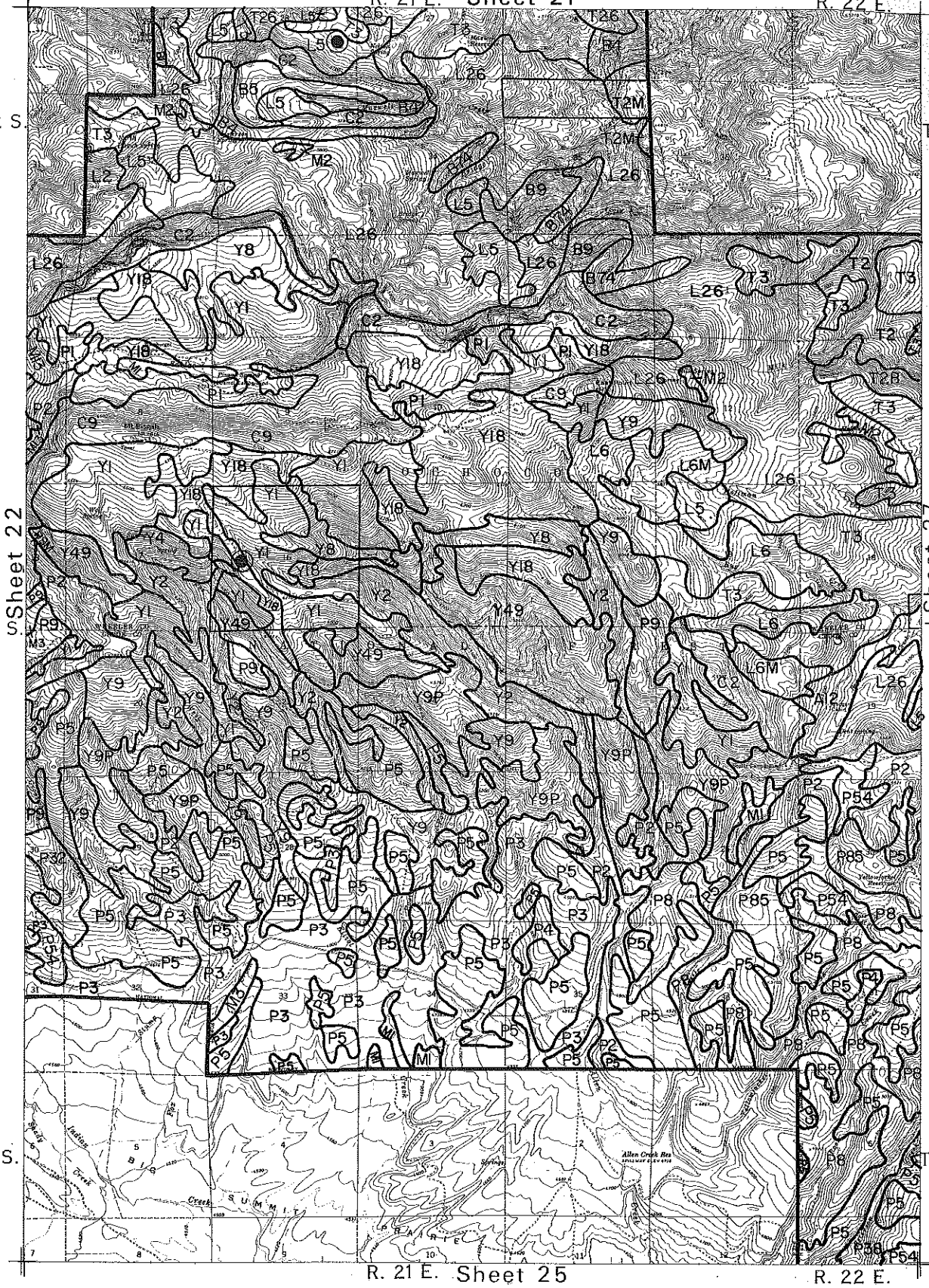
NE Post Quadrangle
Scale 1"=1 Mile
Contour Interval 40 ft.



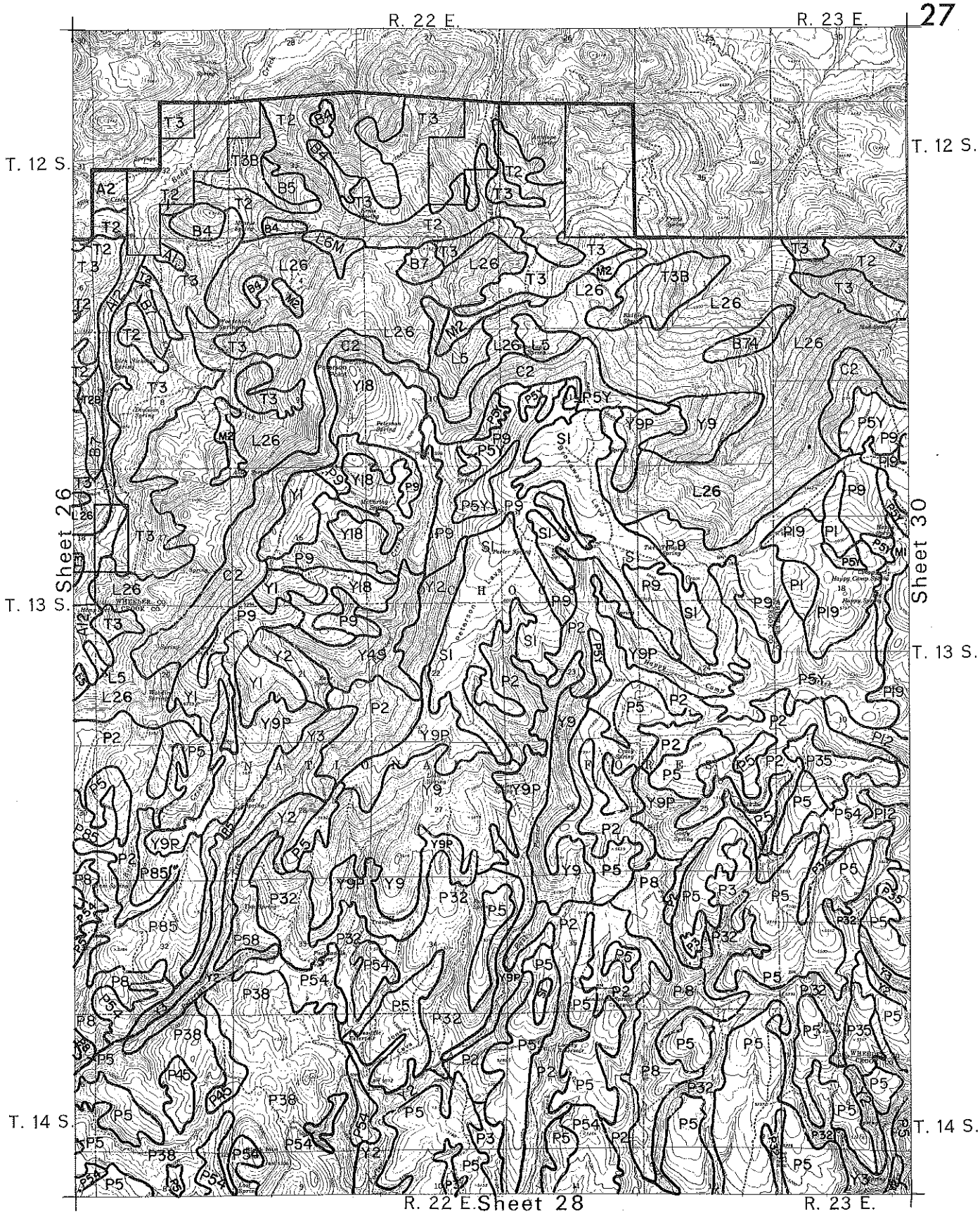
Sheet 41
NW Arrow Wood Pt. Quadrangle
Scale 1"=1Mile



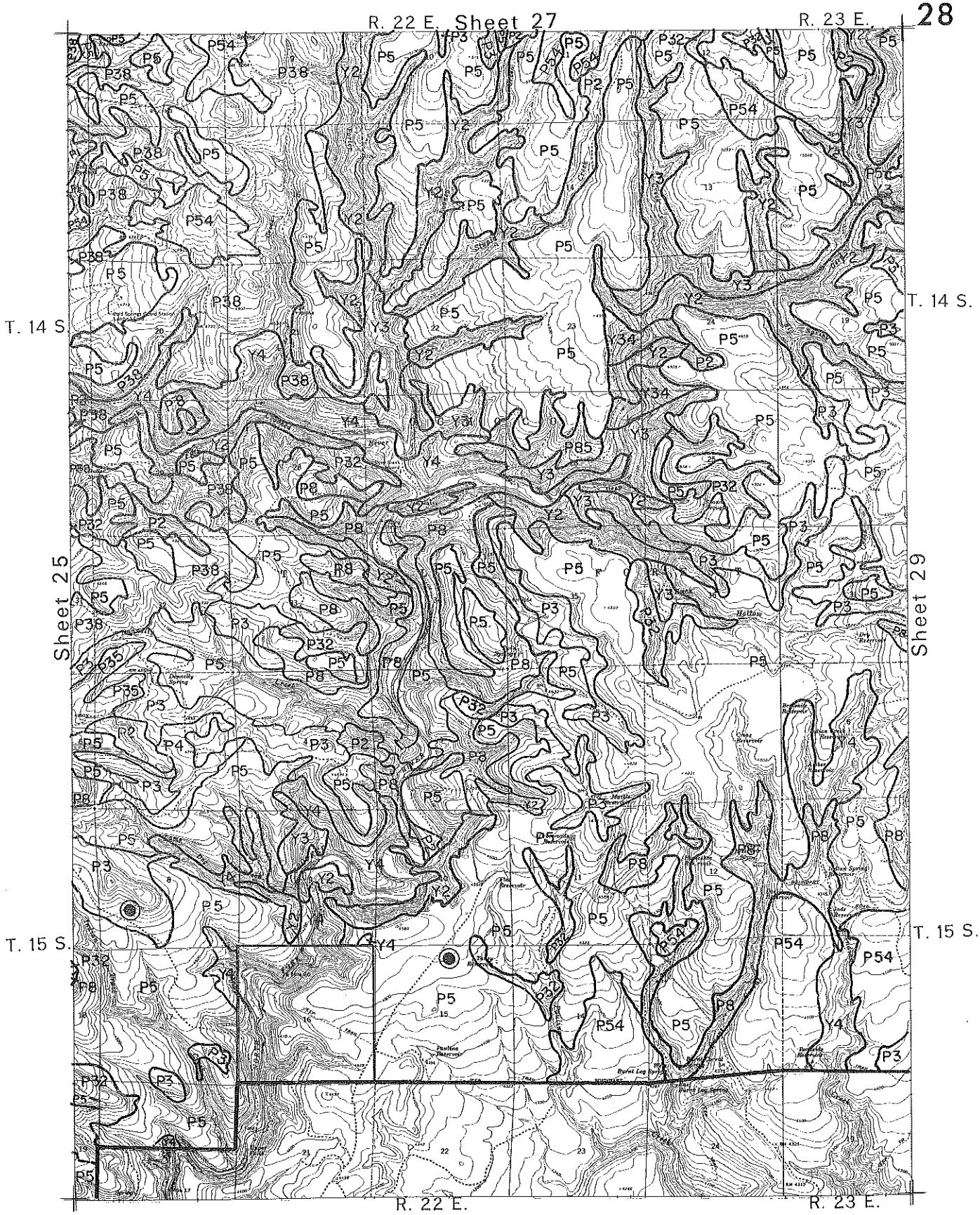
Williams Prairie Quadrangle
Scale 1"=1Mile
Contour Interval 20 ft.



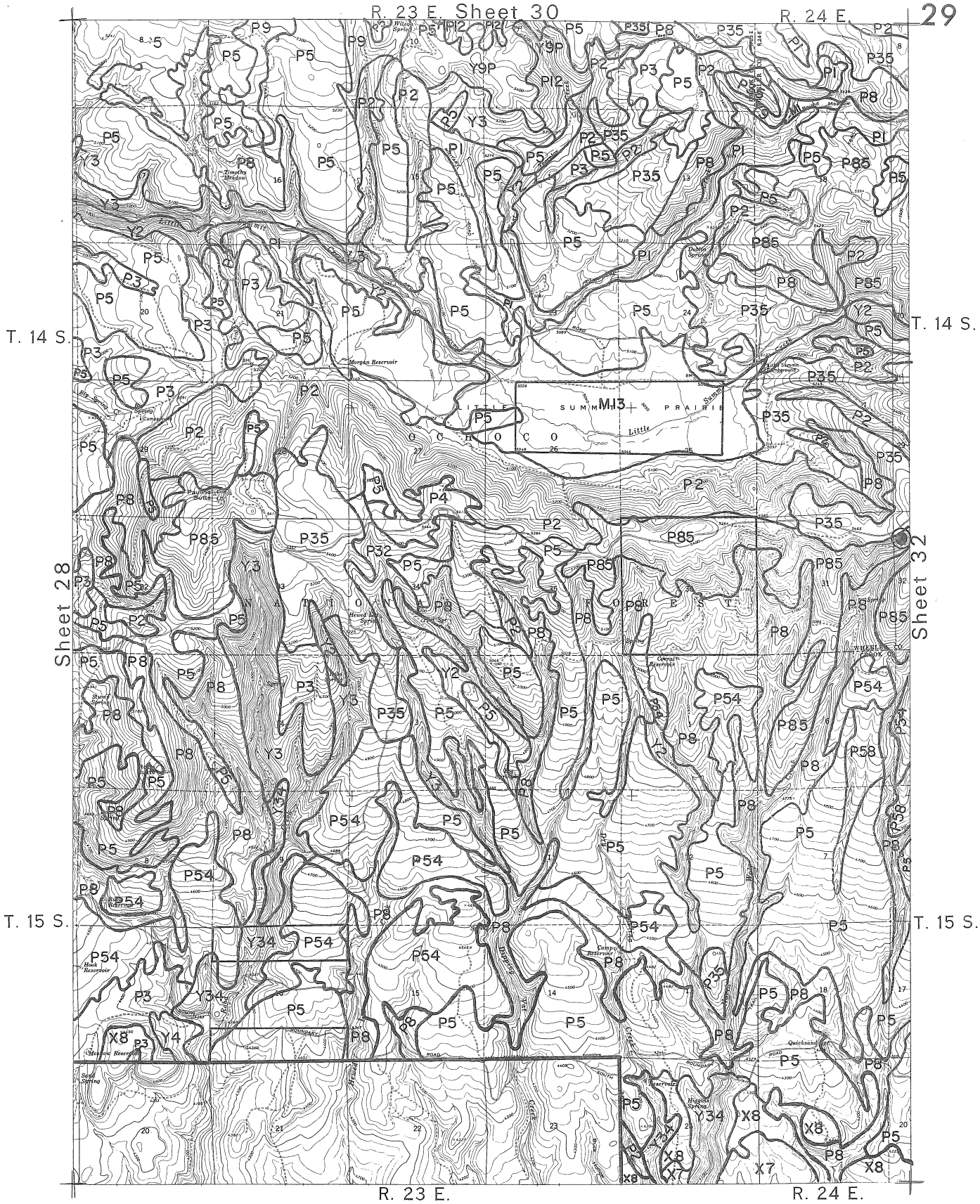
Mt. Pisgah Quadrangle
Scale 1"=1 Mile
Contour Interval 20 ft.



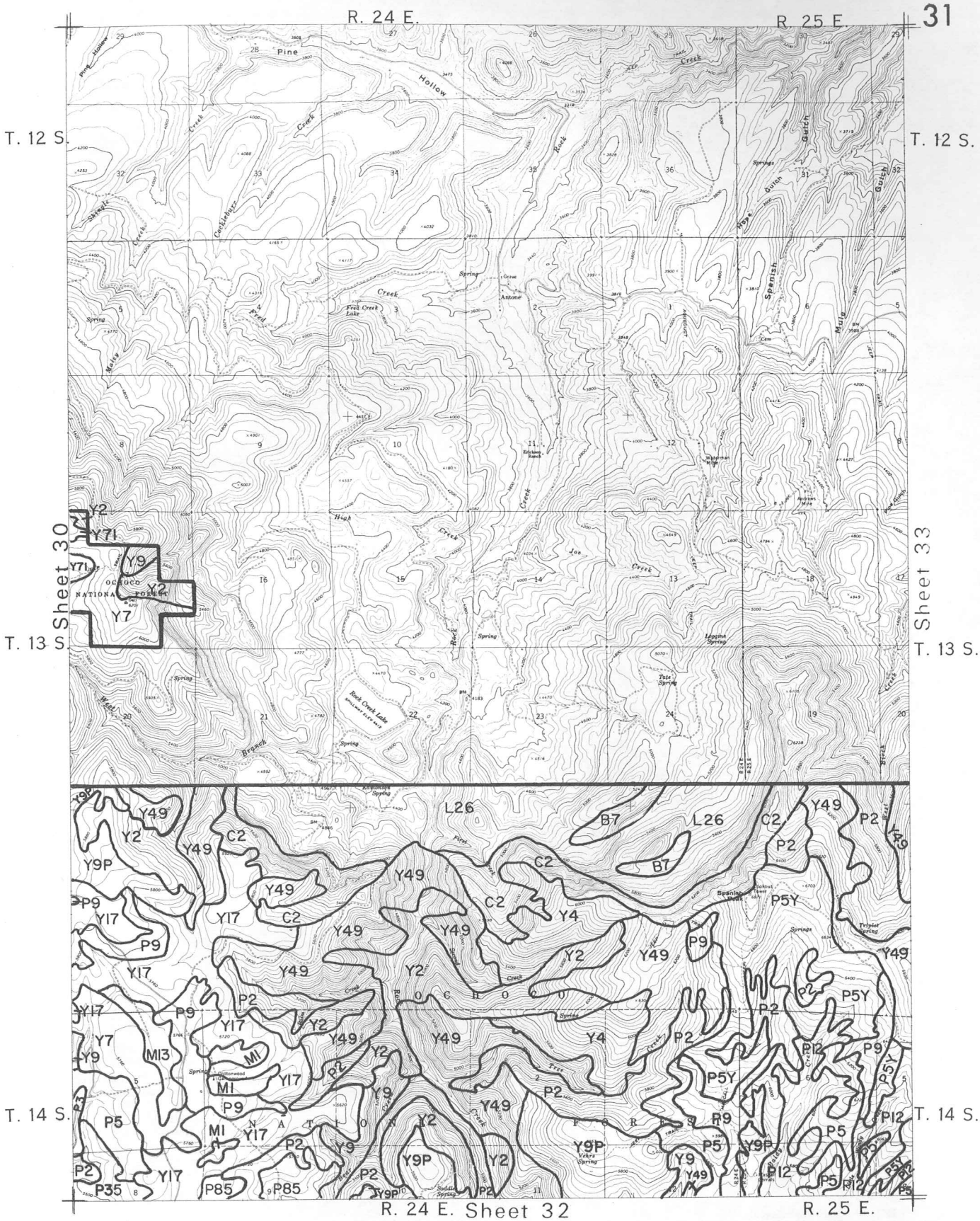
Peterson Point Quadrangle
Scale 1"=1Mile
Contour Interval 20 ft.



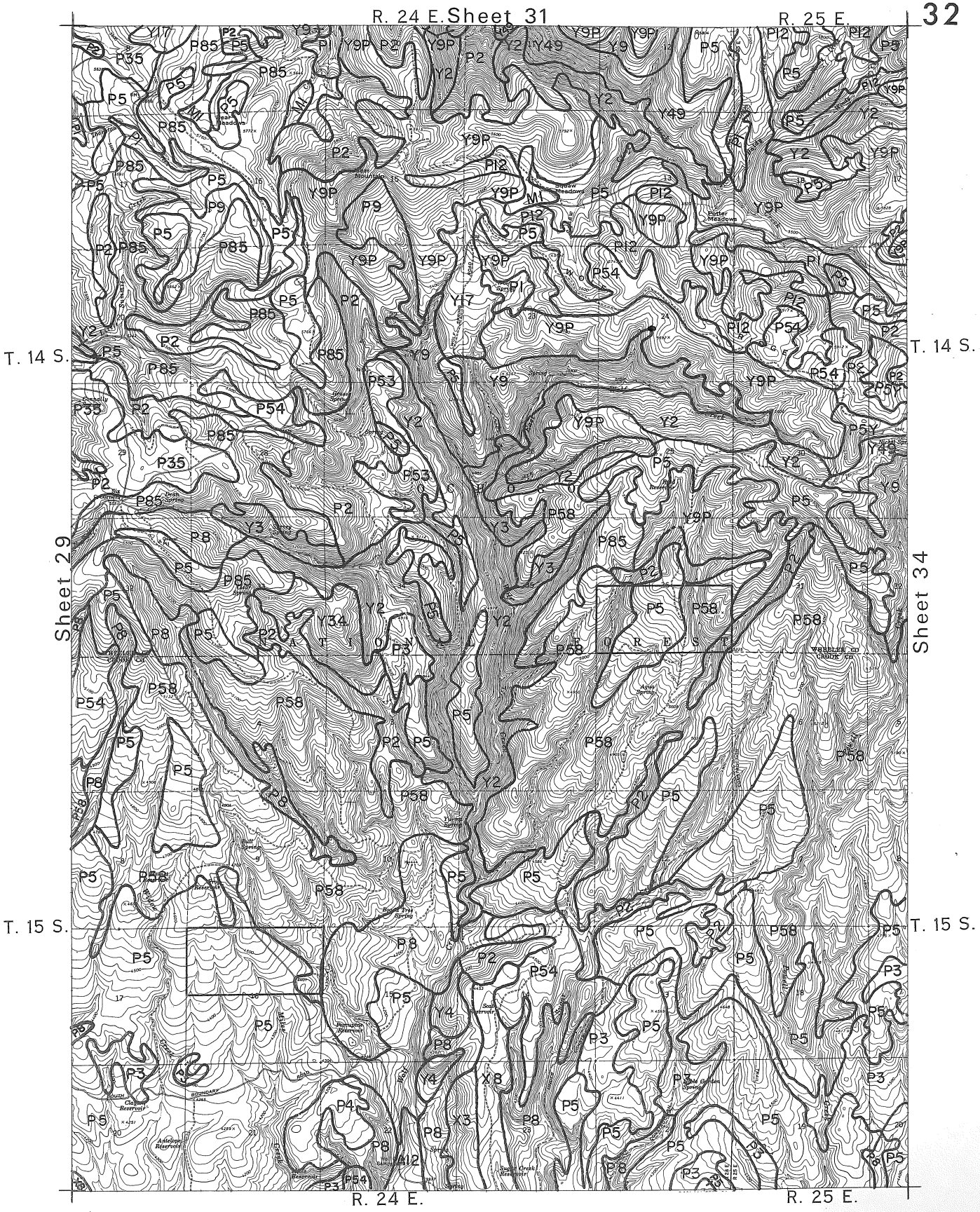
Keys Creek Quadrangle
Scale 1"=1 Mile
Contour Interval 20 ft.


R. 23 E. Sheet 30
R. 24 E.
29
T. 14 S.
T. 14 S.
Sheet 28
Sheet 32
T. 15 S.
T. 15 S.
R. 23 E.
R. 24 E.
LITTLE SUMMIT PRAIRIE
MJ3
OCHOCO
NATIONAL FOREST
Morgan Reservoir
Hook Reservoir
Meadow Reservoir
Quartz Reservoir
Campo Reservoir
Hidden Spring
Quicksand Spring
Sand Spring
Wilson Spring
Dublin Spring
Little Summit Spring
Hewes Lake Spring
Timothy Meadow
Little Summit Prairie Quadrangle
Scale 1"=1Mile
Contour Interval 20 ft.

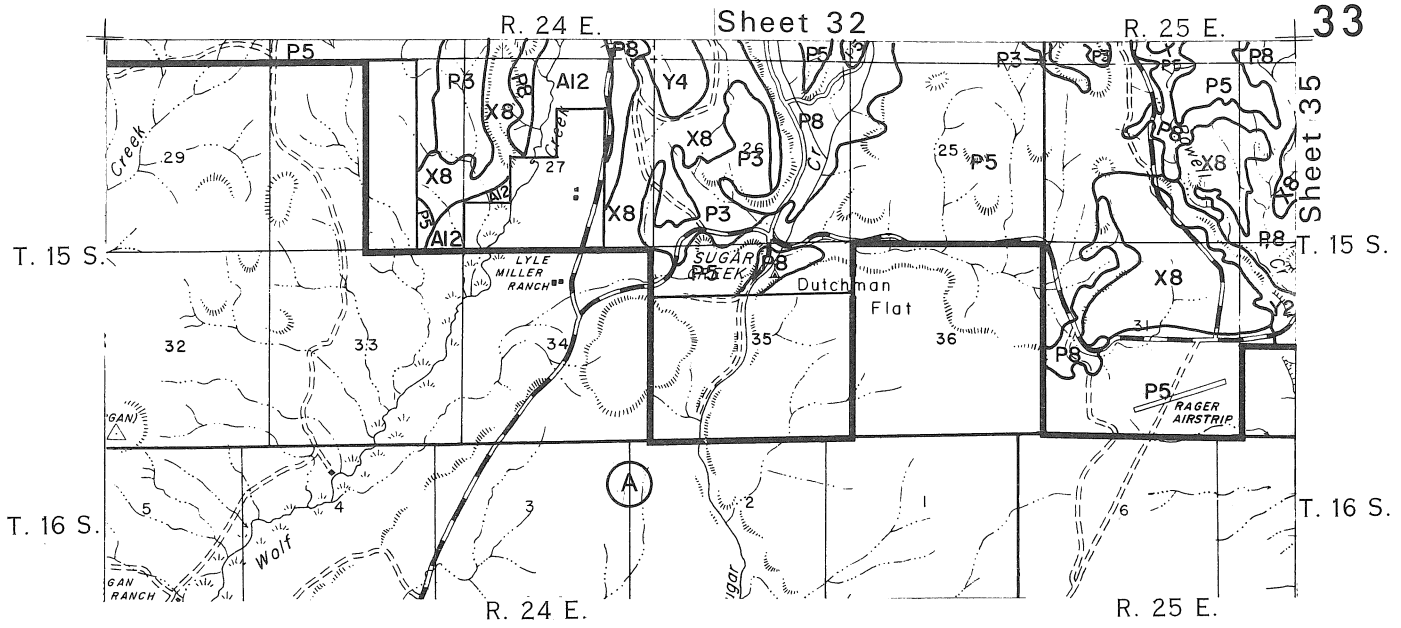
Derr Meadows Quadrangle
Scale 1"=1 Mile
Contour Interval 20 ft.



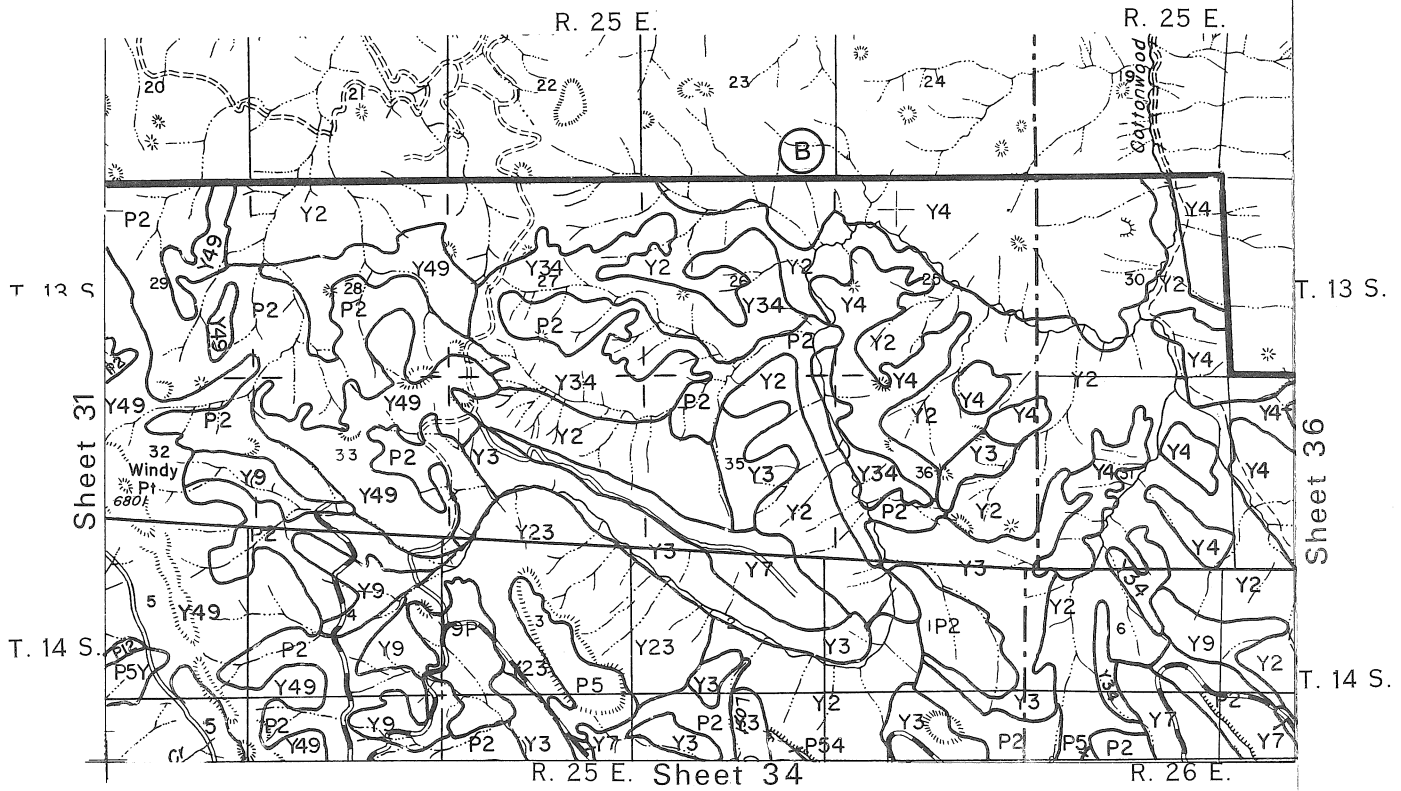
Antone Quadrangle
Scale 1"= 1 Mile
Contour Interval 40 ft.



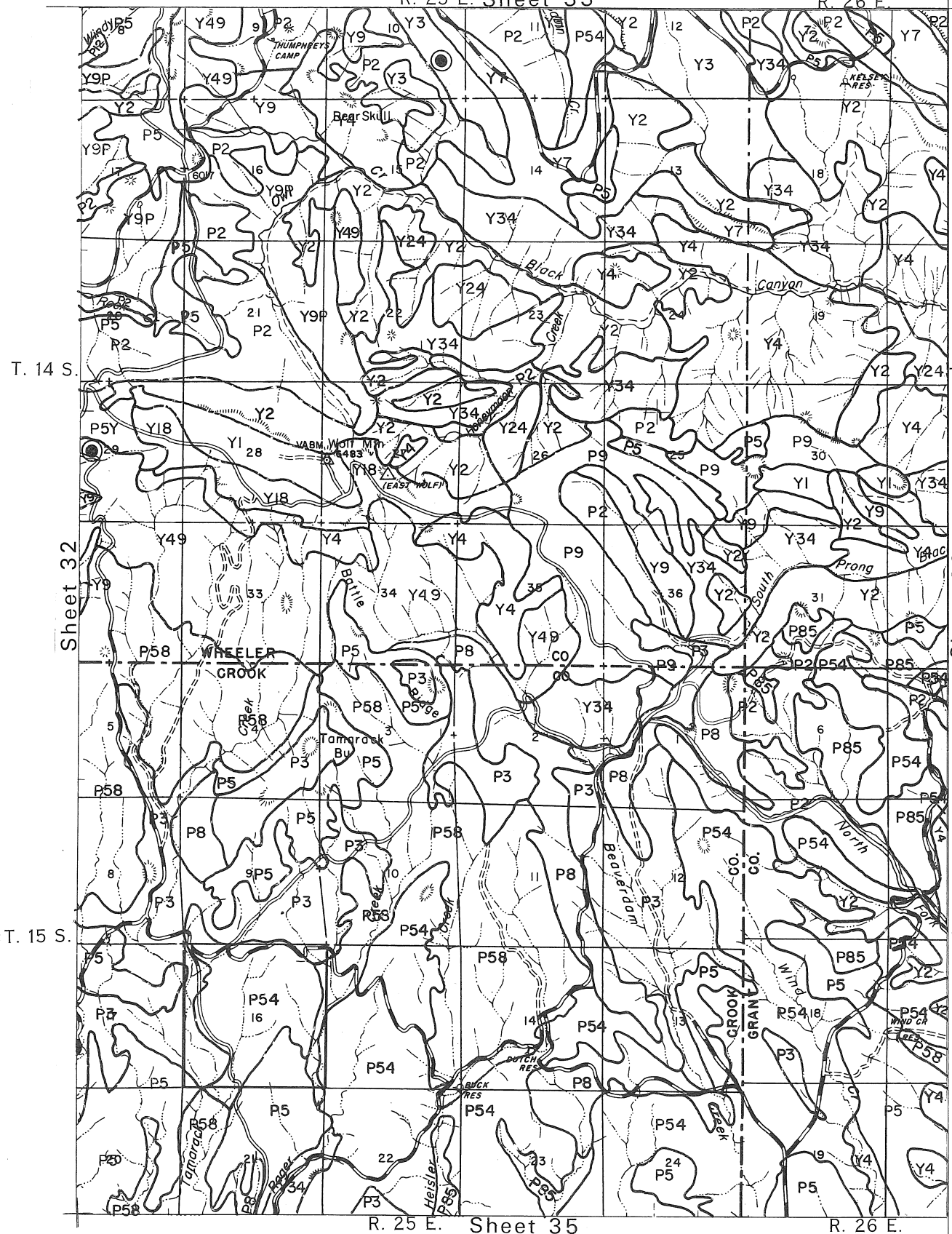
Six Corners Quadrangle
Scale 1"=1Mile
Contour Interval 20 ft.



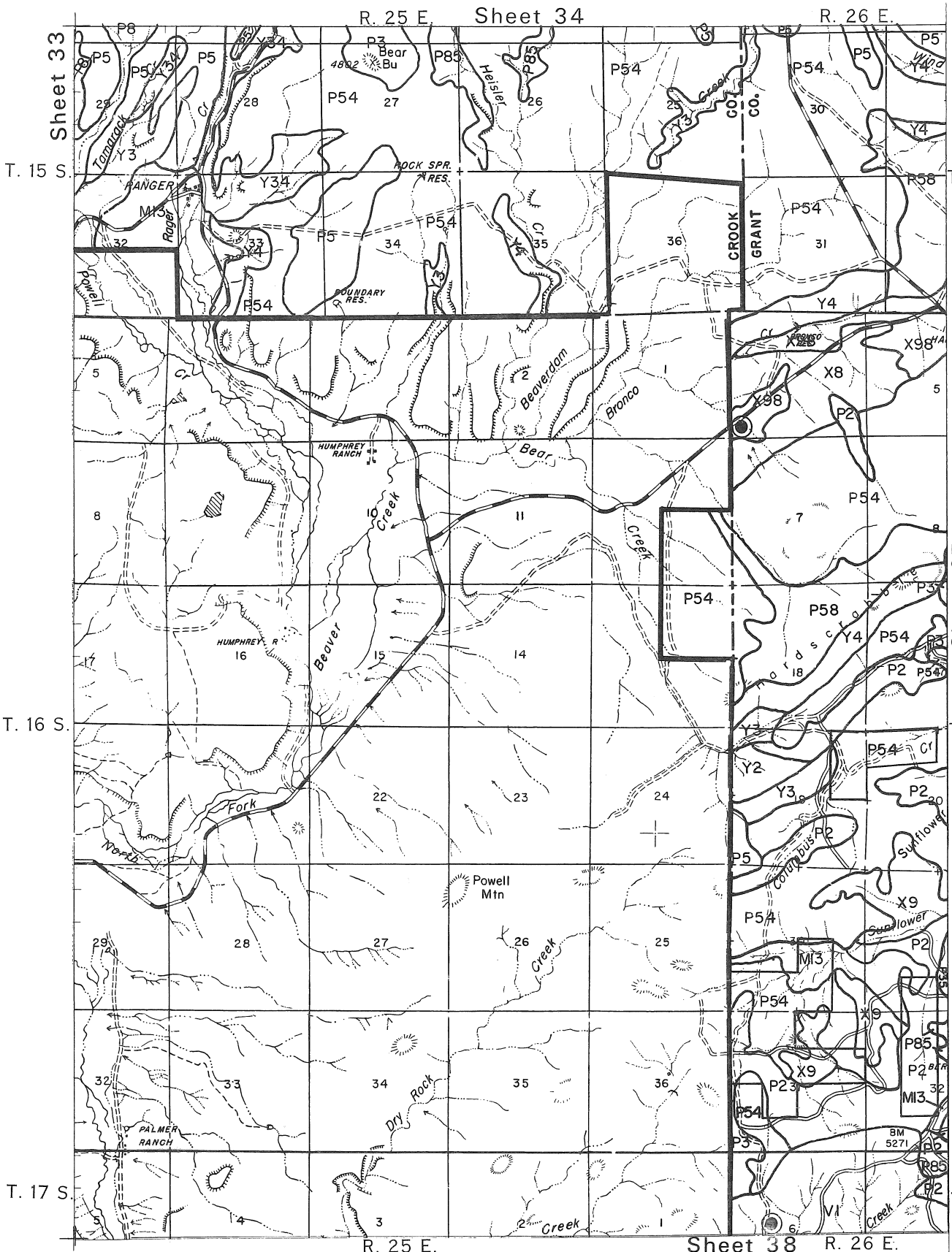
NE Dayville 3 Quadrangle
Scale 1"=1 Mile

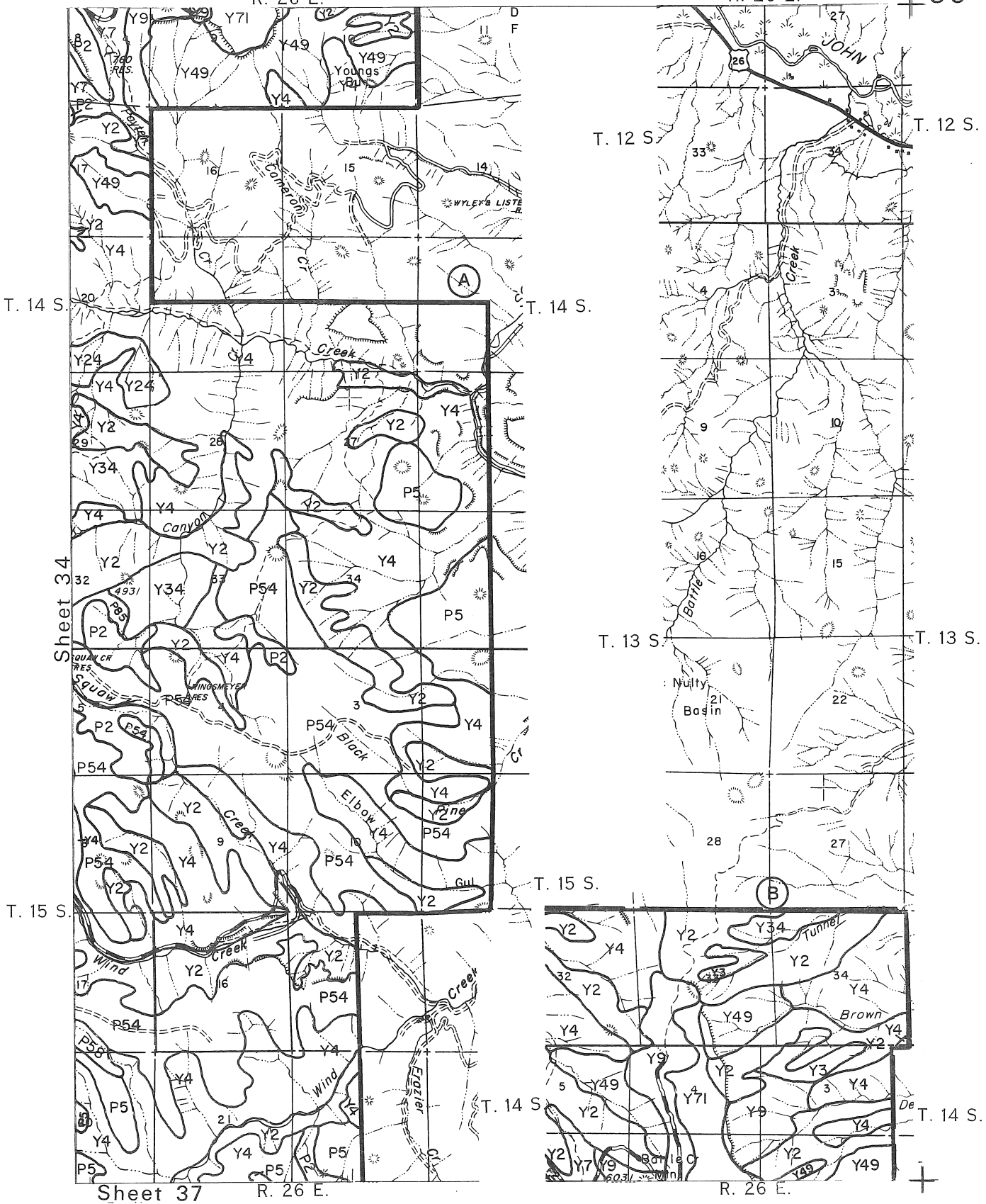


NW Dayville 1 Quadrangle
Scale 1"=1 Mile



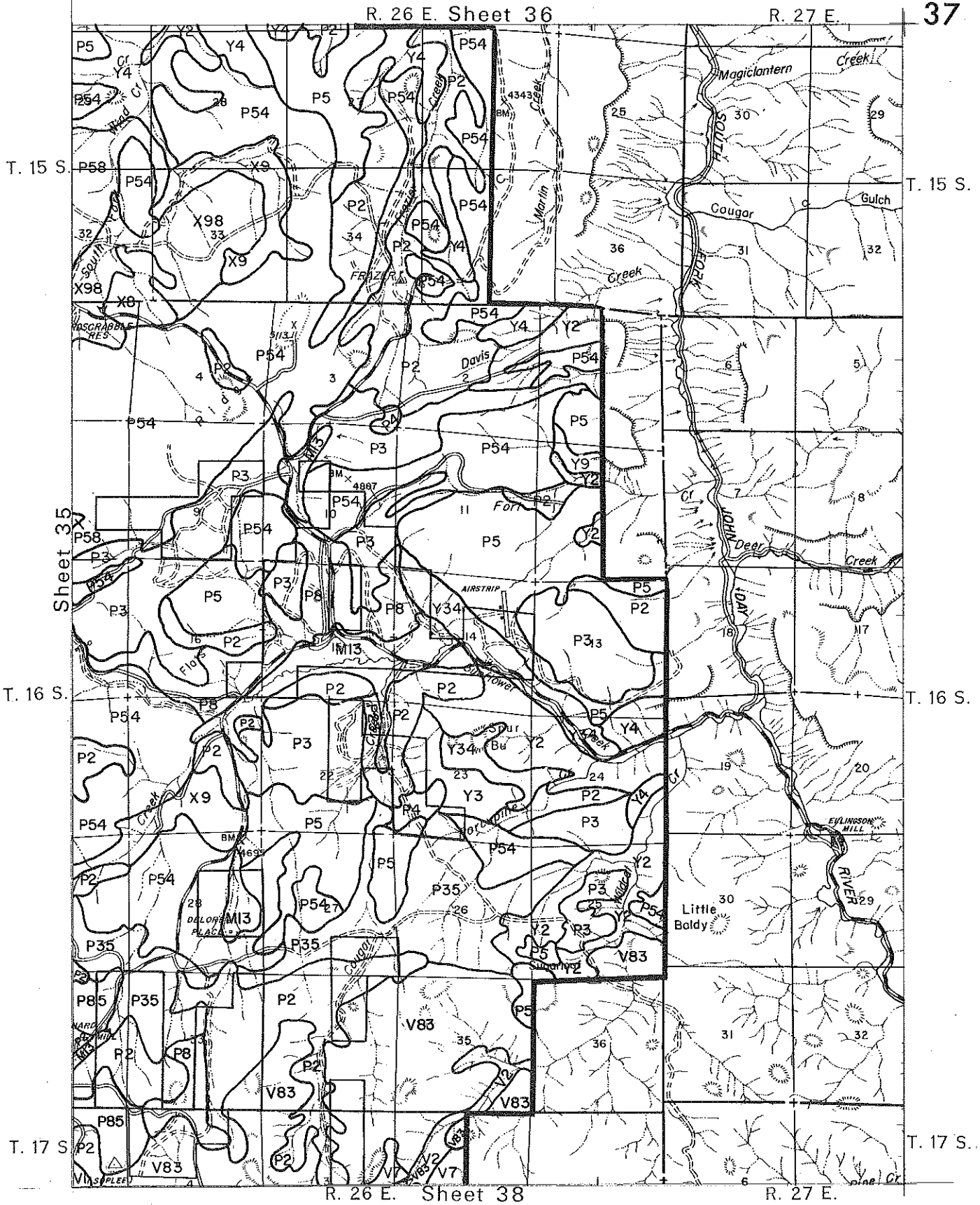
SW Dayville 1 Quadrangle
Scale 1"=1 Mile


R. 25 E.
Sheet 34
R. 26 E.
Sheet 33
Sheet 37
T. 15 S.
T. 16 S.
T. 17 S.
Tamarack Cr
RANGER
Roger
Powell
ROCK SPR. RES.
BOUNDARY RES.
Heisler
Creek
CROOK CO.
GRANT CO.
Bear Bu
4802
Cr
Bronco
Beaverdam
Bear Creek
HUMPHREY RANCH
HUMPHREY R
Beaver
North Fork
Powell Mtn
Dry Rock Creek
PALMER RANCH
Columbus
Sunflower
BM 5271
Sheet 38
R. 25 E.
R. 26 E.
NW Dayville 4 Quadrangle
Scale 1"=1 Mile



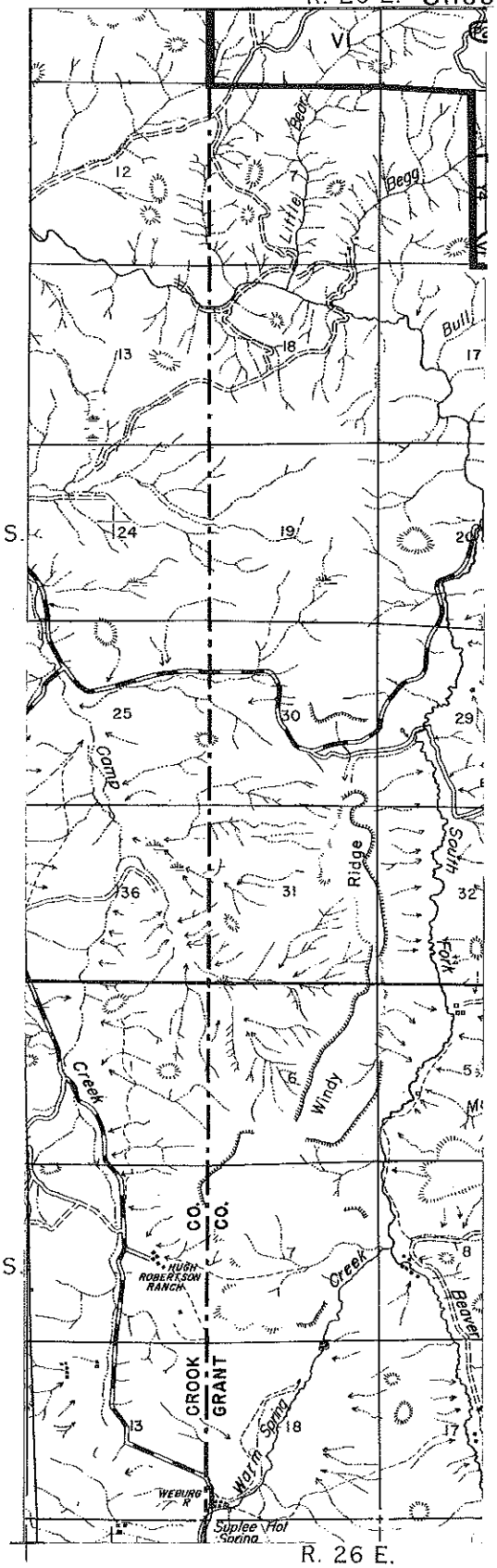
Sheet 37 R. 26 E.
SE Dayville 1 Quadrangle
Scale 1"=1 Mile

NE Dayville 1 Quadrangle
Scale 1"=1 Mile



NE Dayville 4 Quadrangle
Scale 1"= 1 Mile

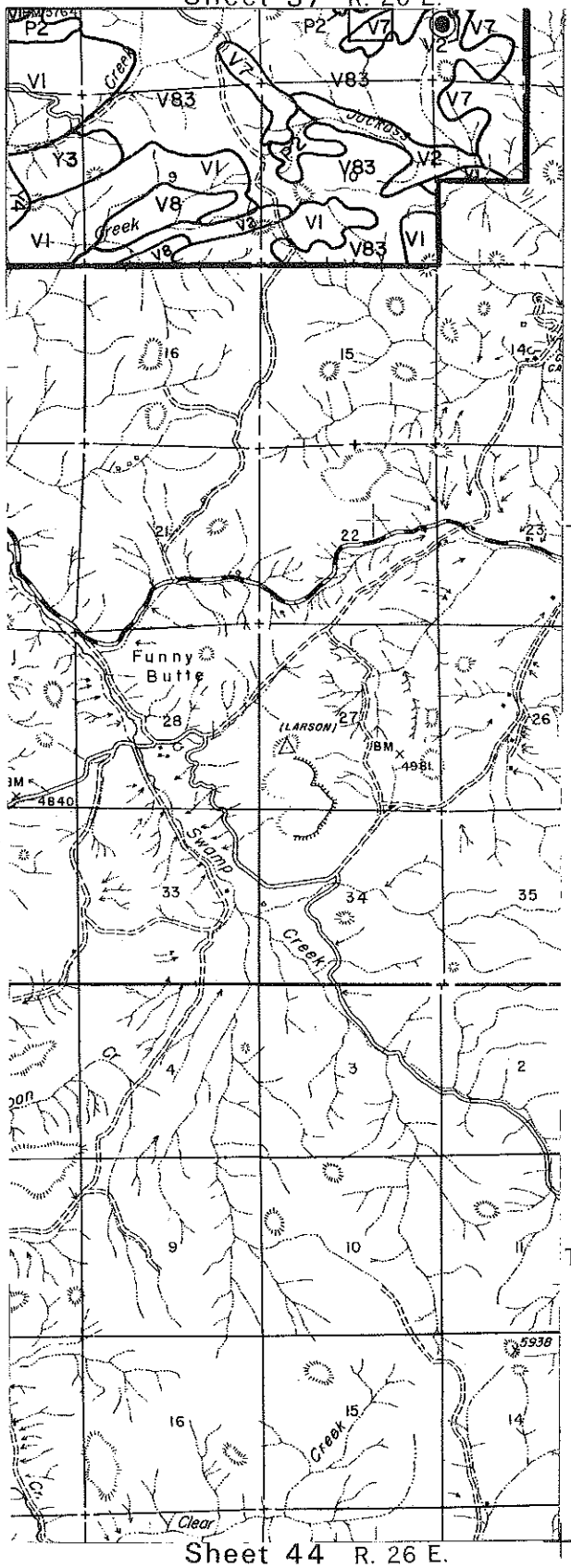
R. 26 E. Sheet 35



R. 26 E.

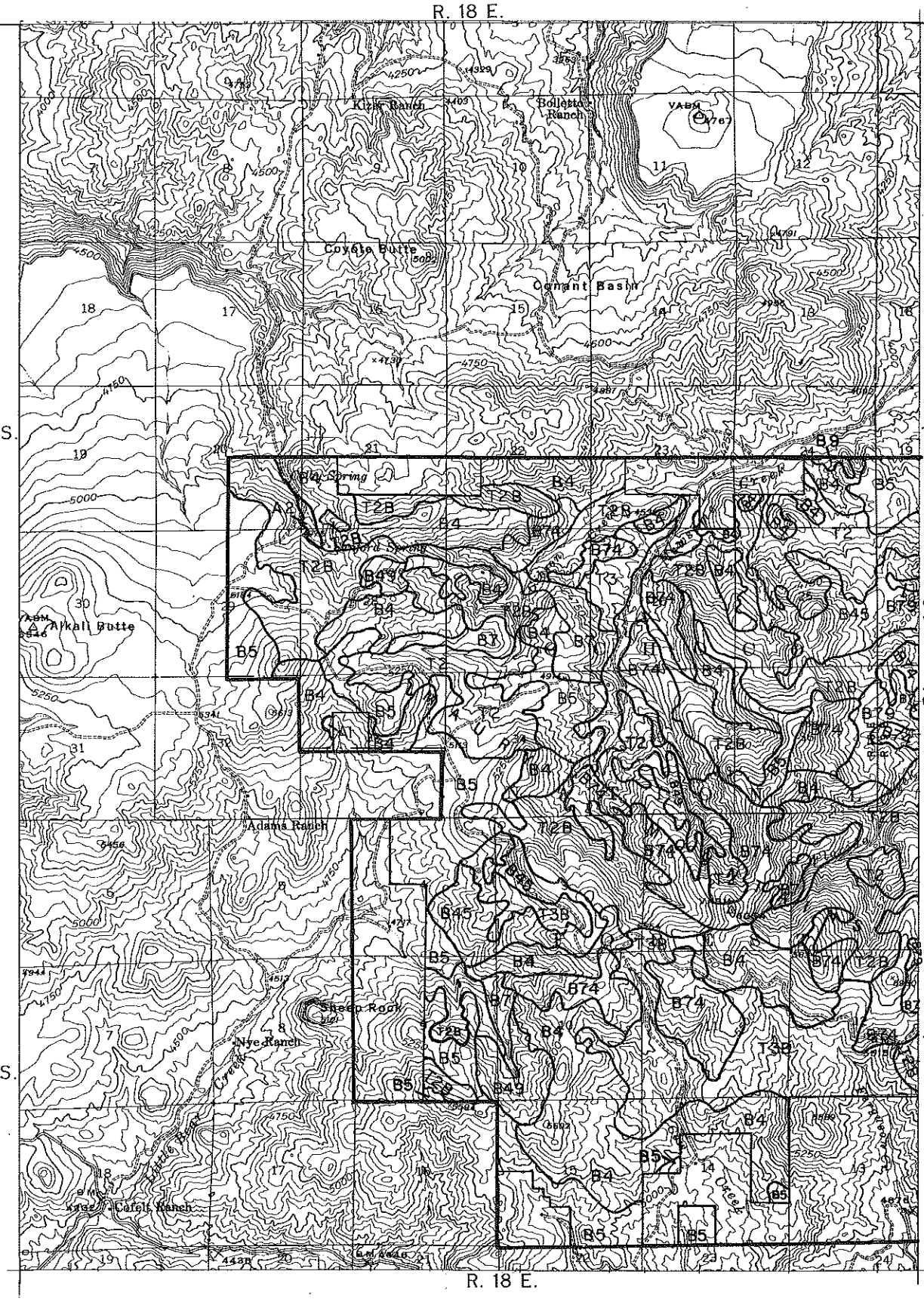
SE Dayville 4 Quadrangle
Scale 1"=1 Mile

Sheet 37 R. 26 E.

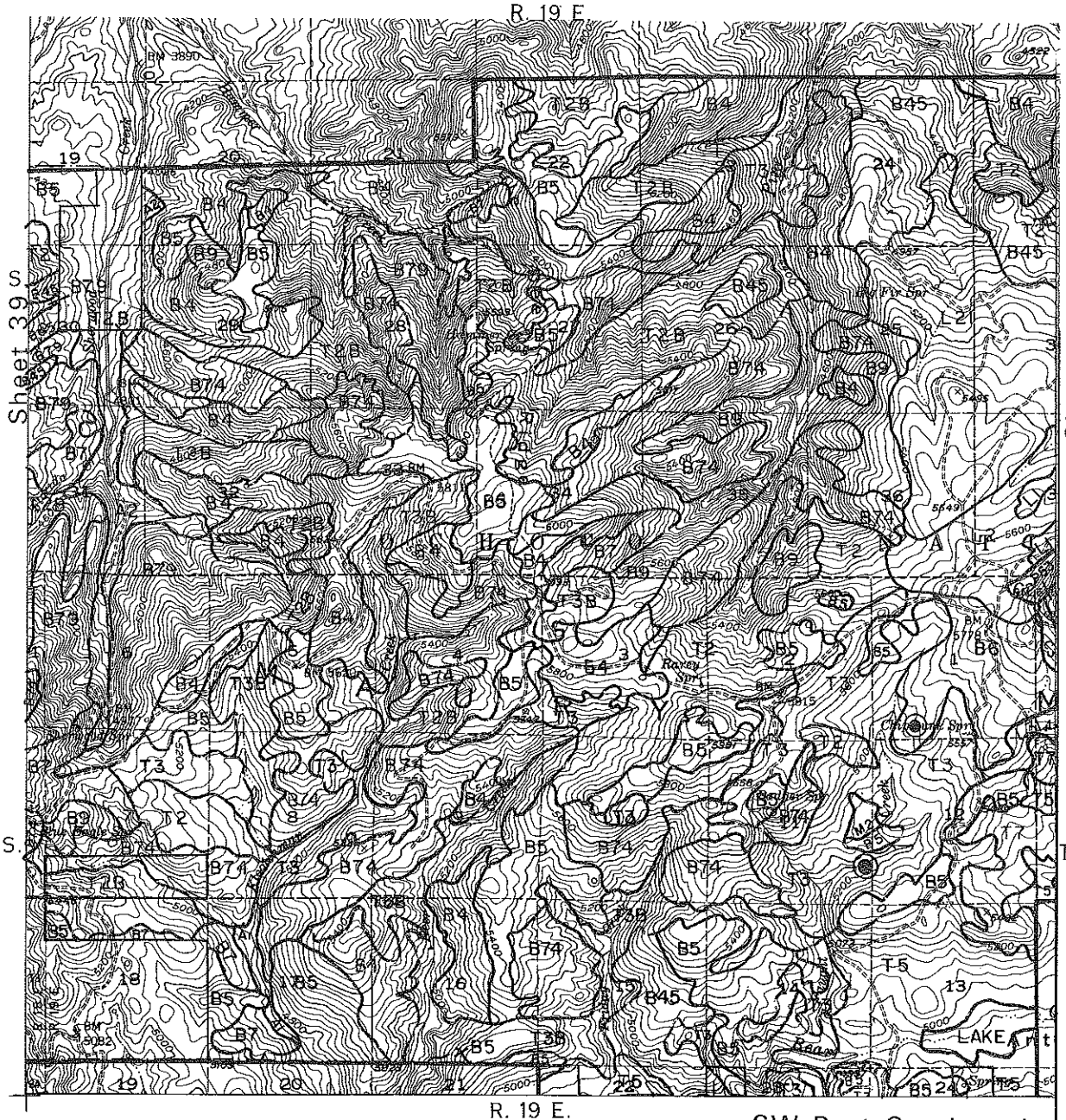


Sheet 44 R. 26 E.

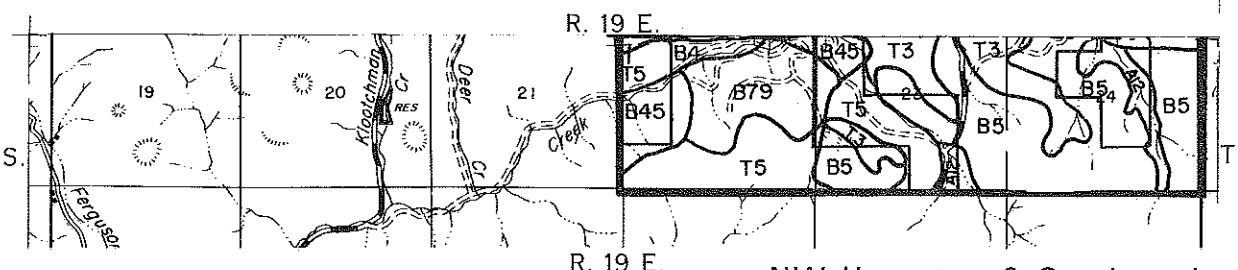
SW Dayville 4 Quadrangle
Scale 1"=1 Mile



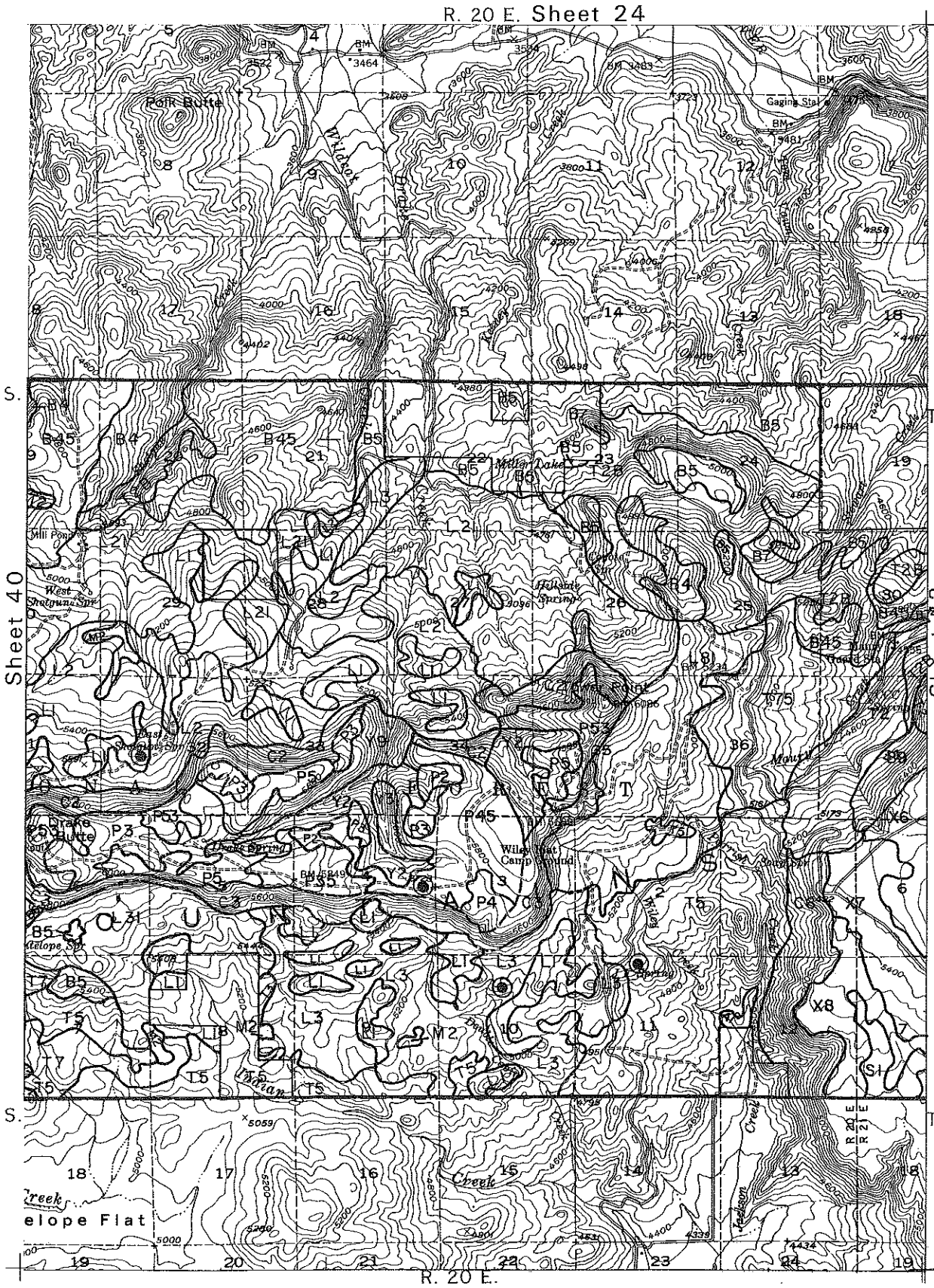
SE Eagle Rock Quadrangle
Scale 1"=1 Mile
Contour Interval 50 ft.



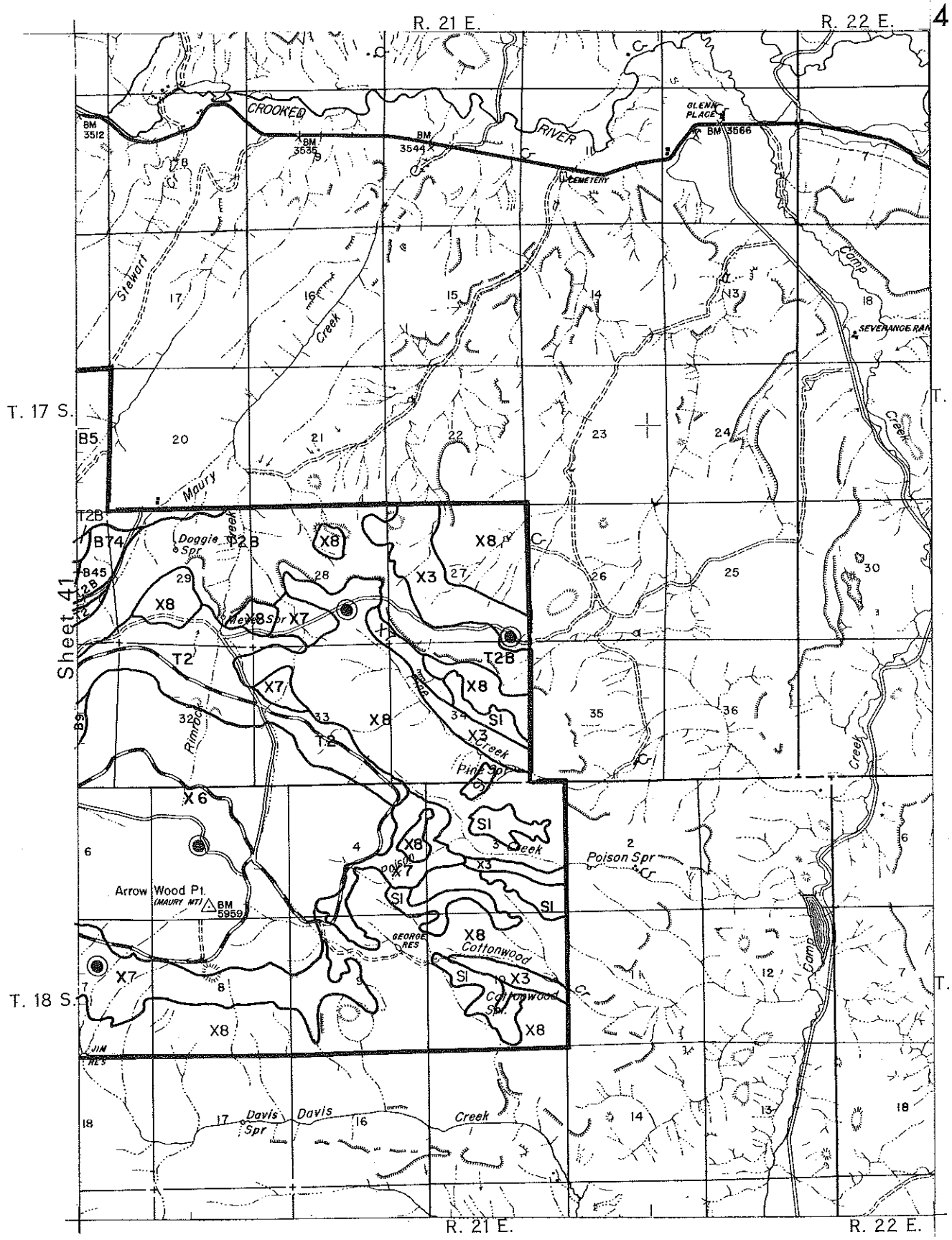
SW Post Quadrangle
Scale 1"=1 Mile
Contour Interval 40 ft.



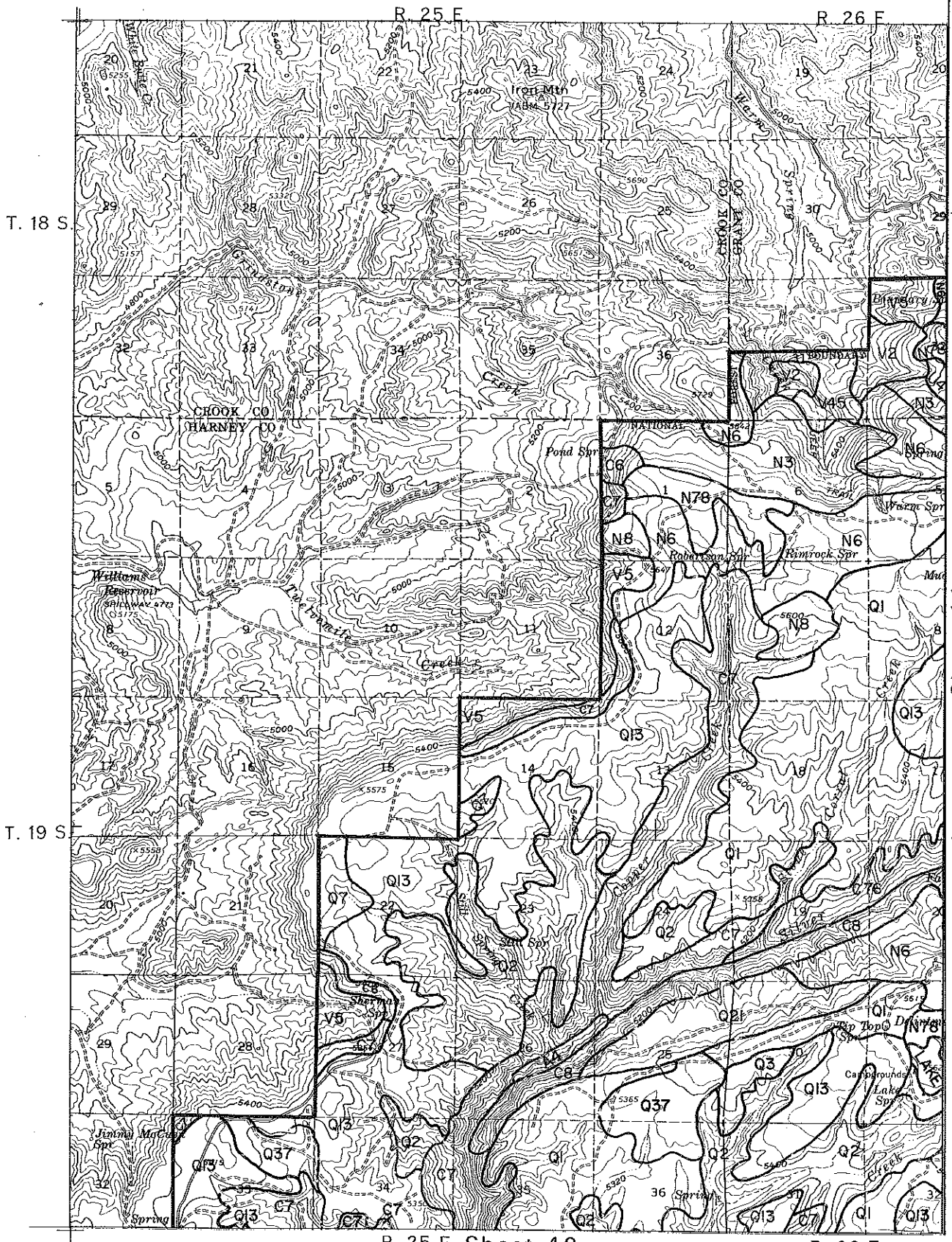
NW Hampton 2 Quadrangle
Scale 1"=1 Mile



SE Post Quadrangle
Scale 1"=1 Mile
Contour Interval 40 ft.

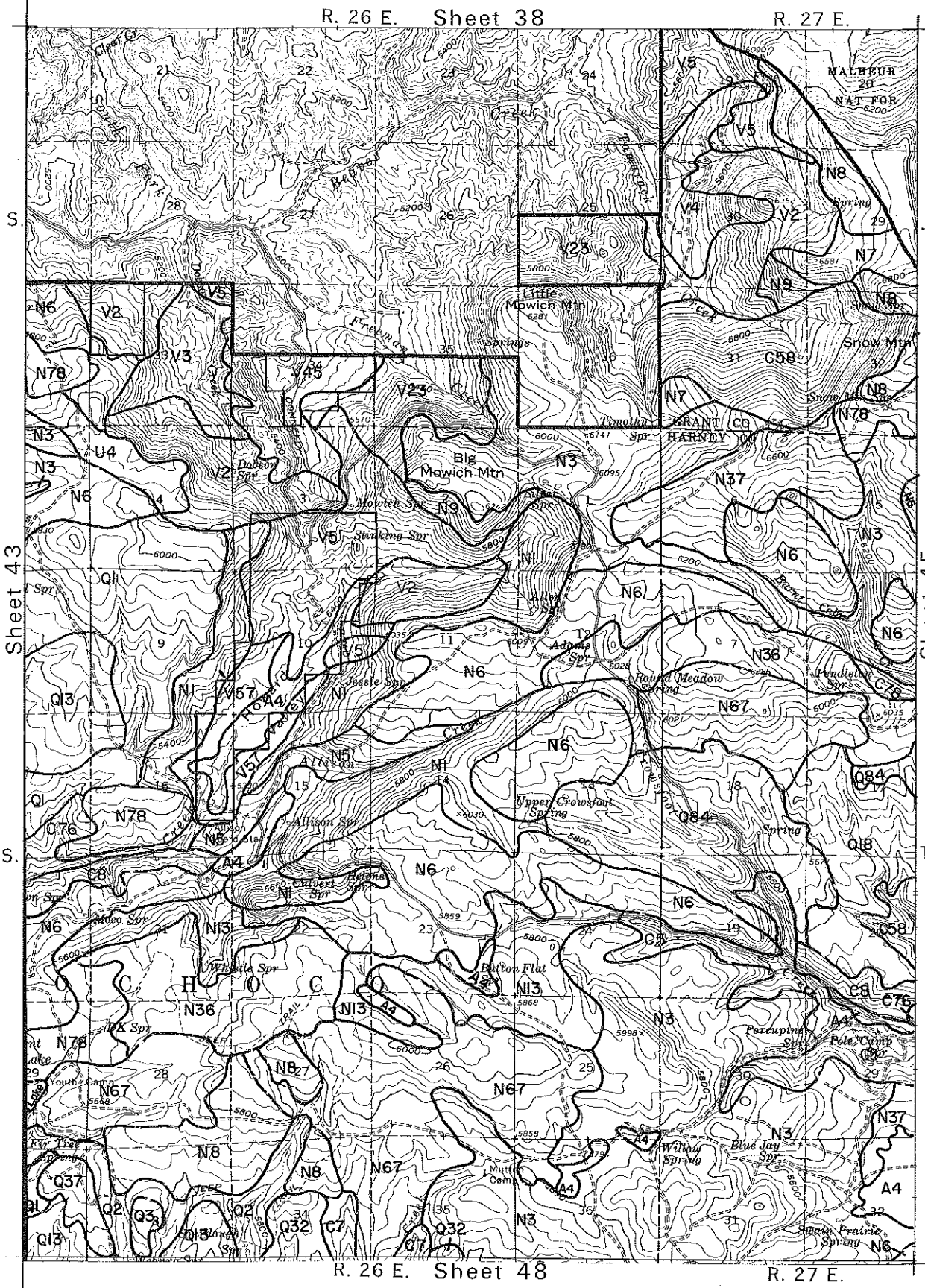


SW Arrow Wood Pt. Quadrangle
Scale 1"=1 Mile

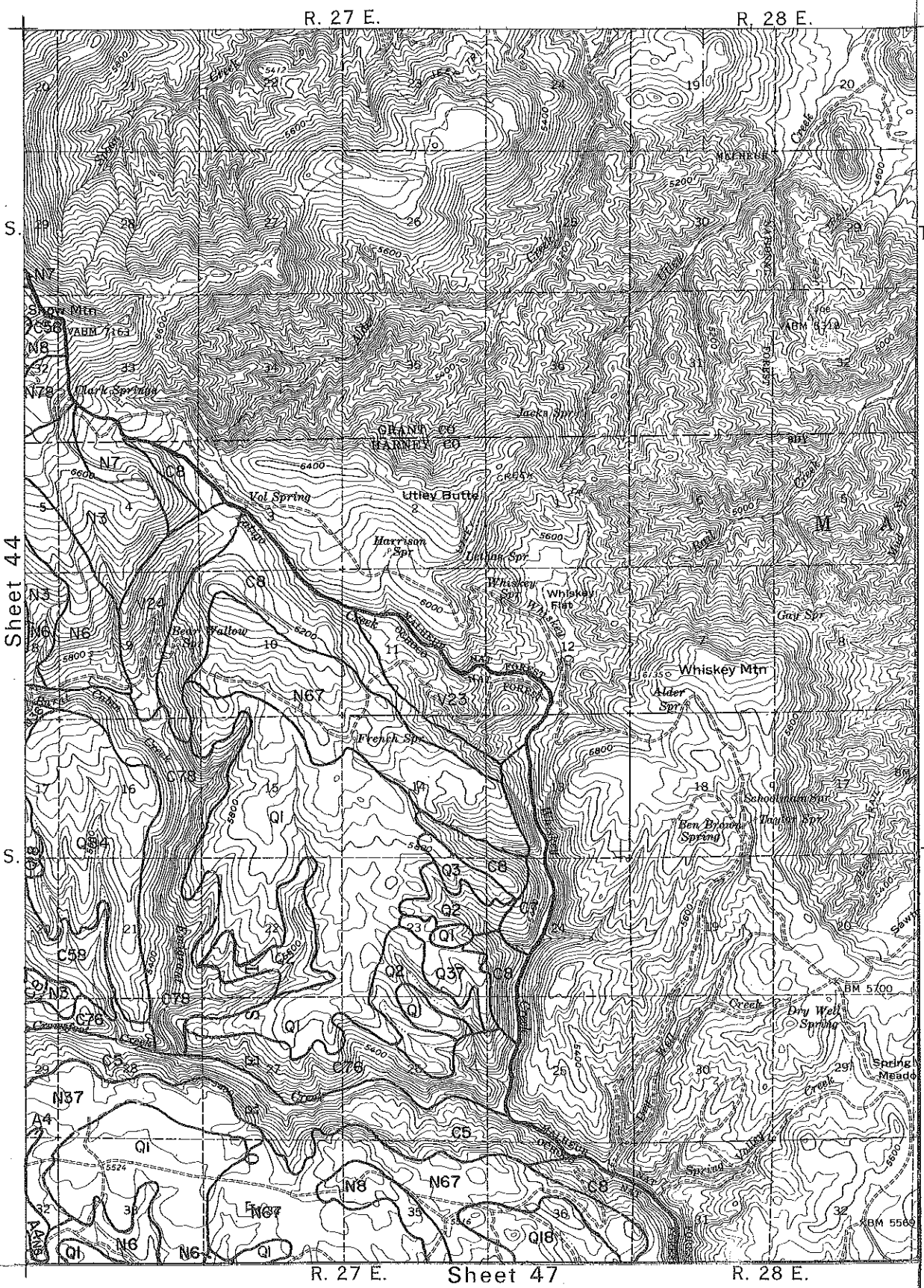


R. 25 E. Sheet 49 R. 26 E.

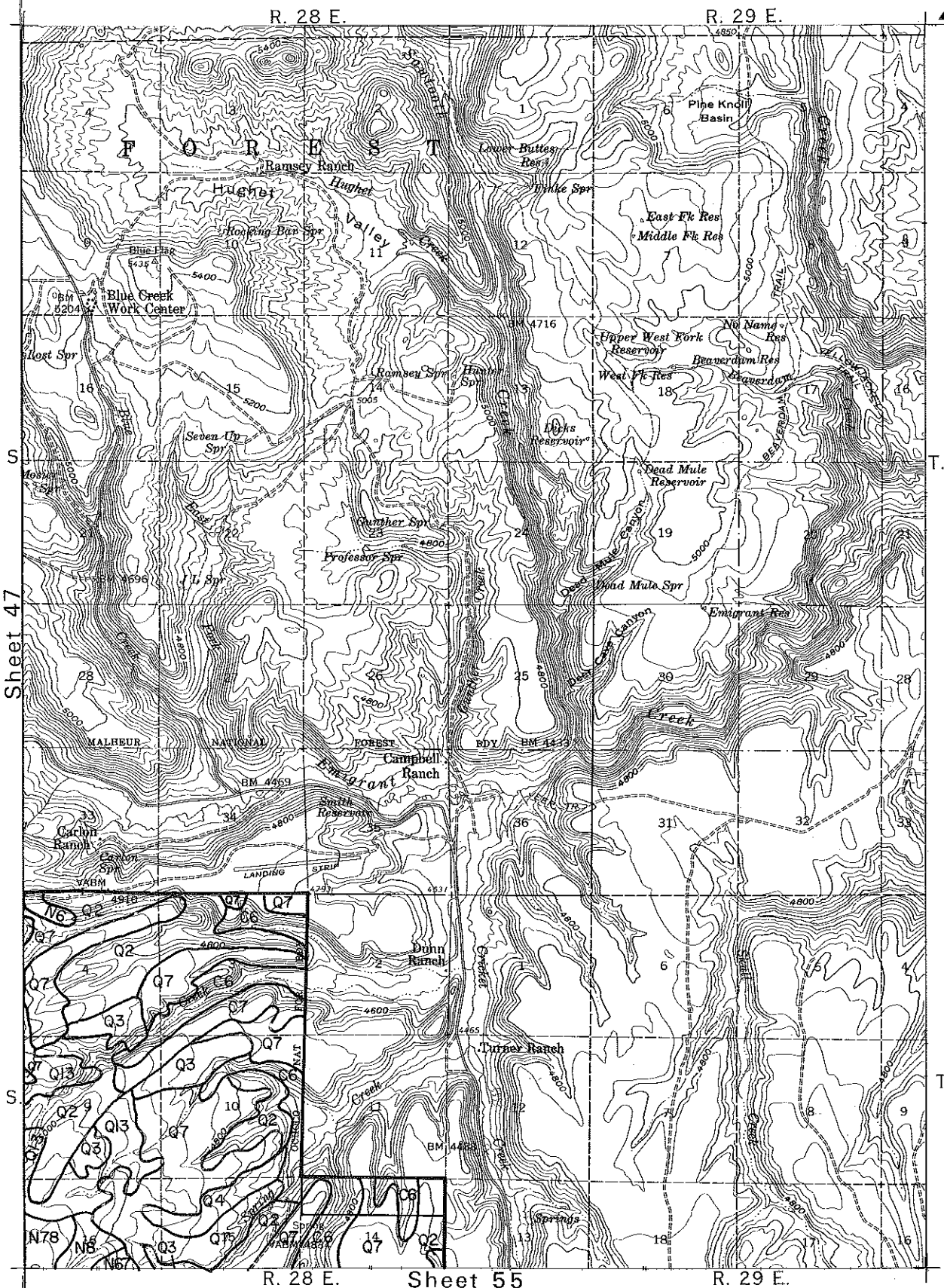
NW Delintment Lake Quadrangle
Scale 1"=1 Mile
Contour Interval 40 ft.



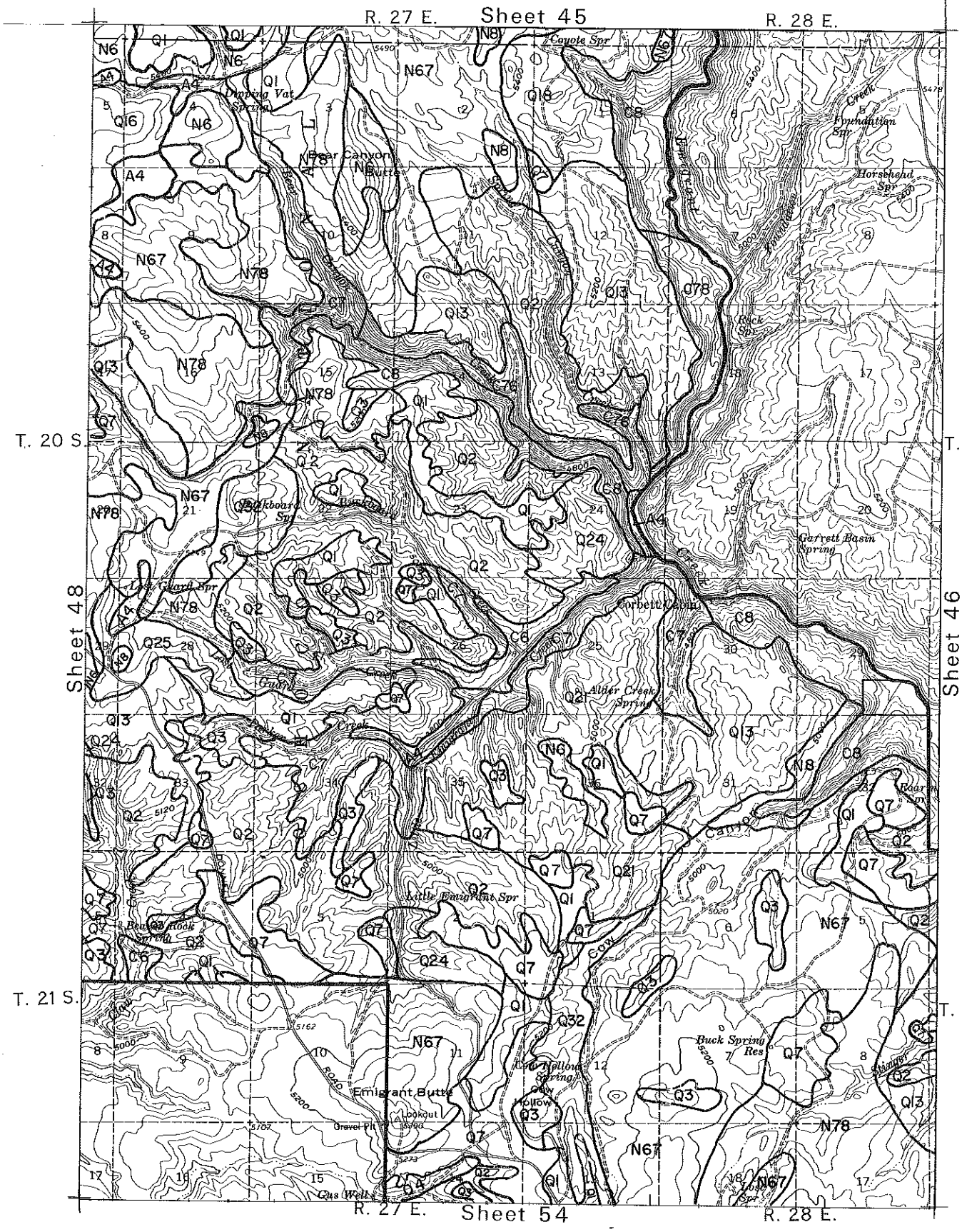
NE Delintment Lake Quadrangle
Scale 1"= 1 Mile
Contour Interval 40 ft.



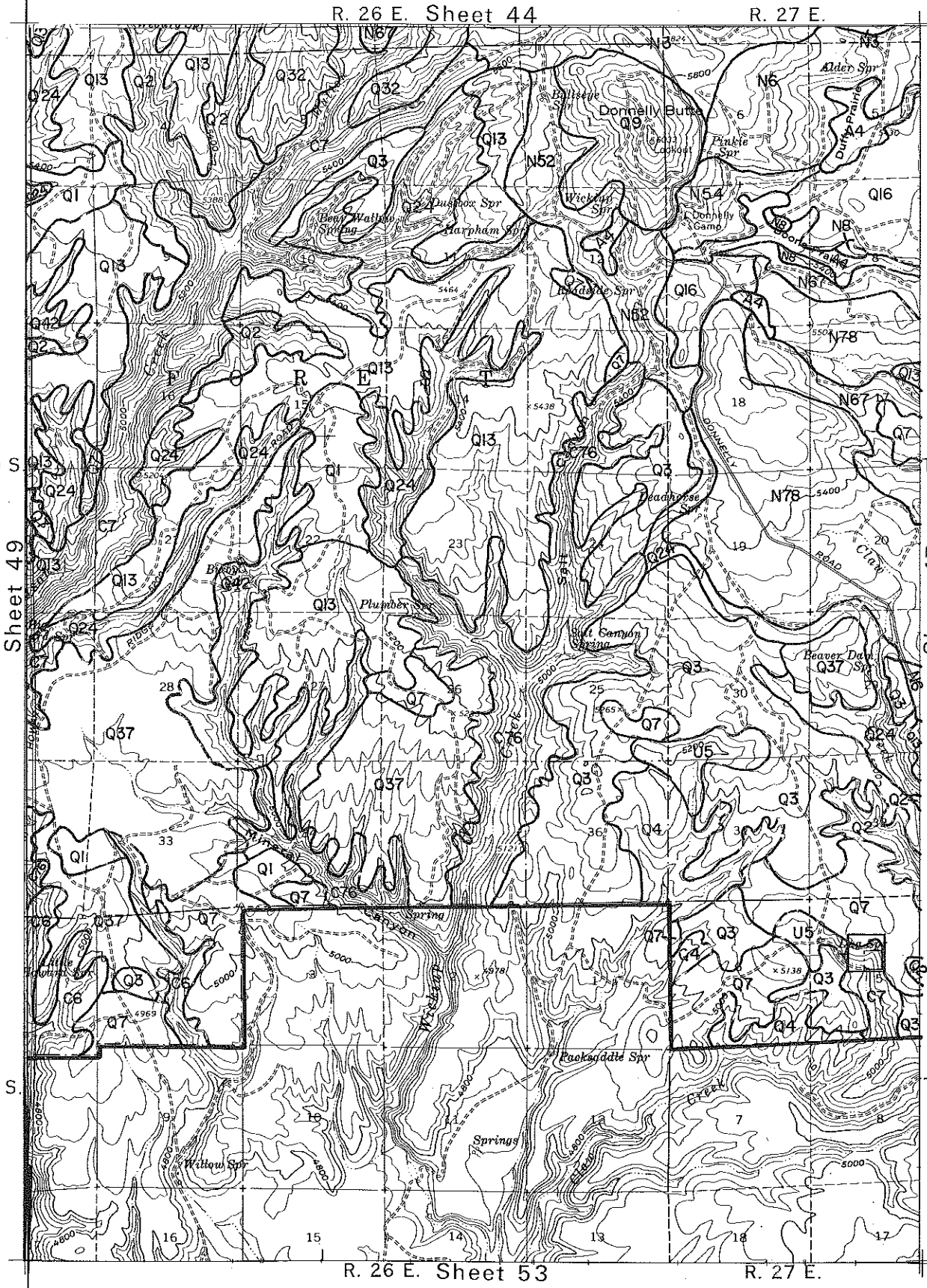
NW Sawtooth Creek Quadrangle
Scale 1"=1 Mile
Contour Interval 40 ft.



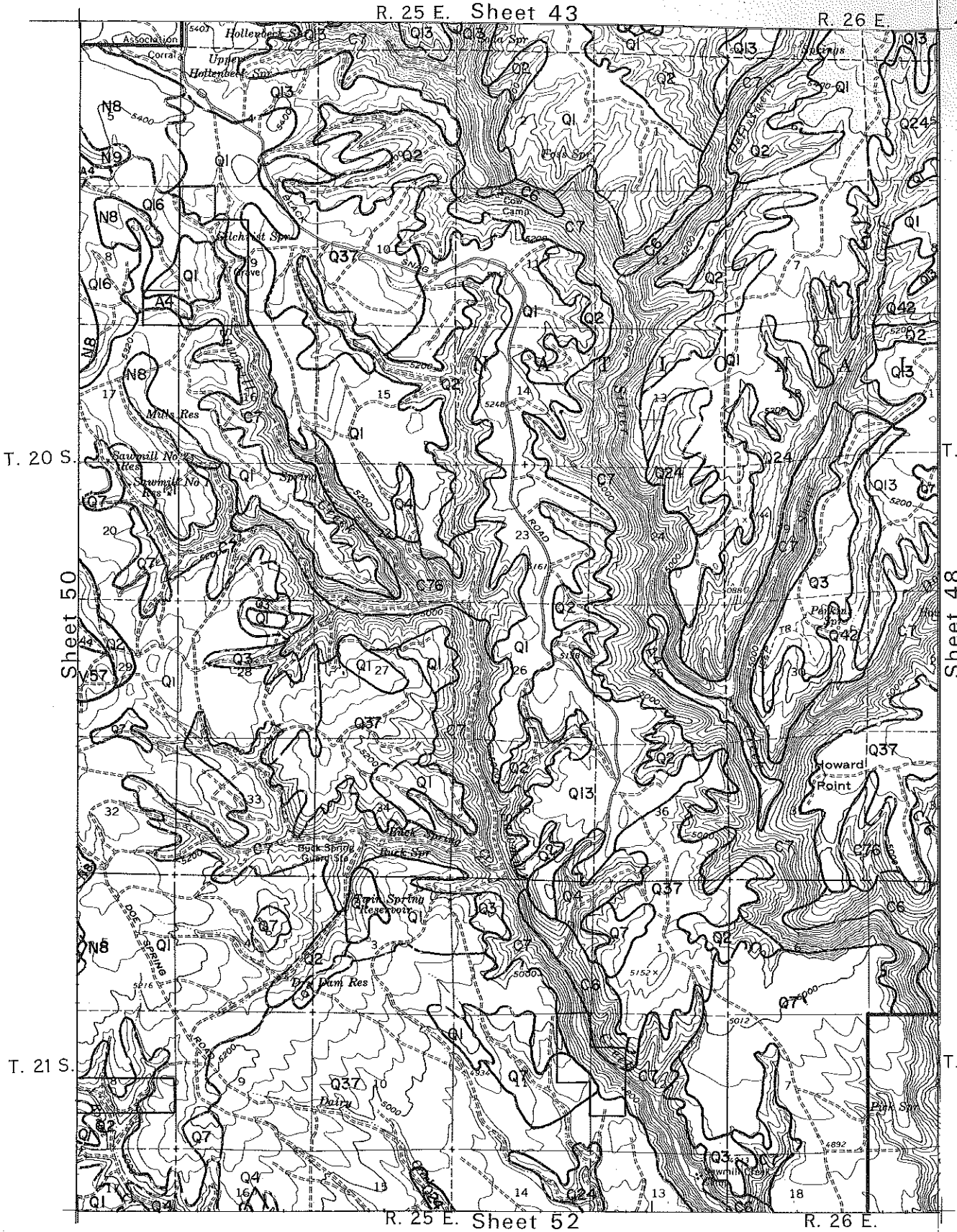
SE Sawtooth Creek Quadrangle
Scale 1"=1 Mile
Contour Interval 40 ft.



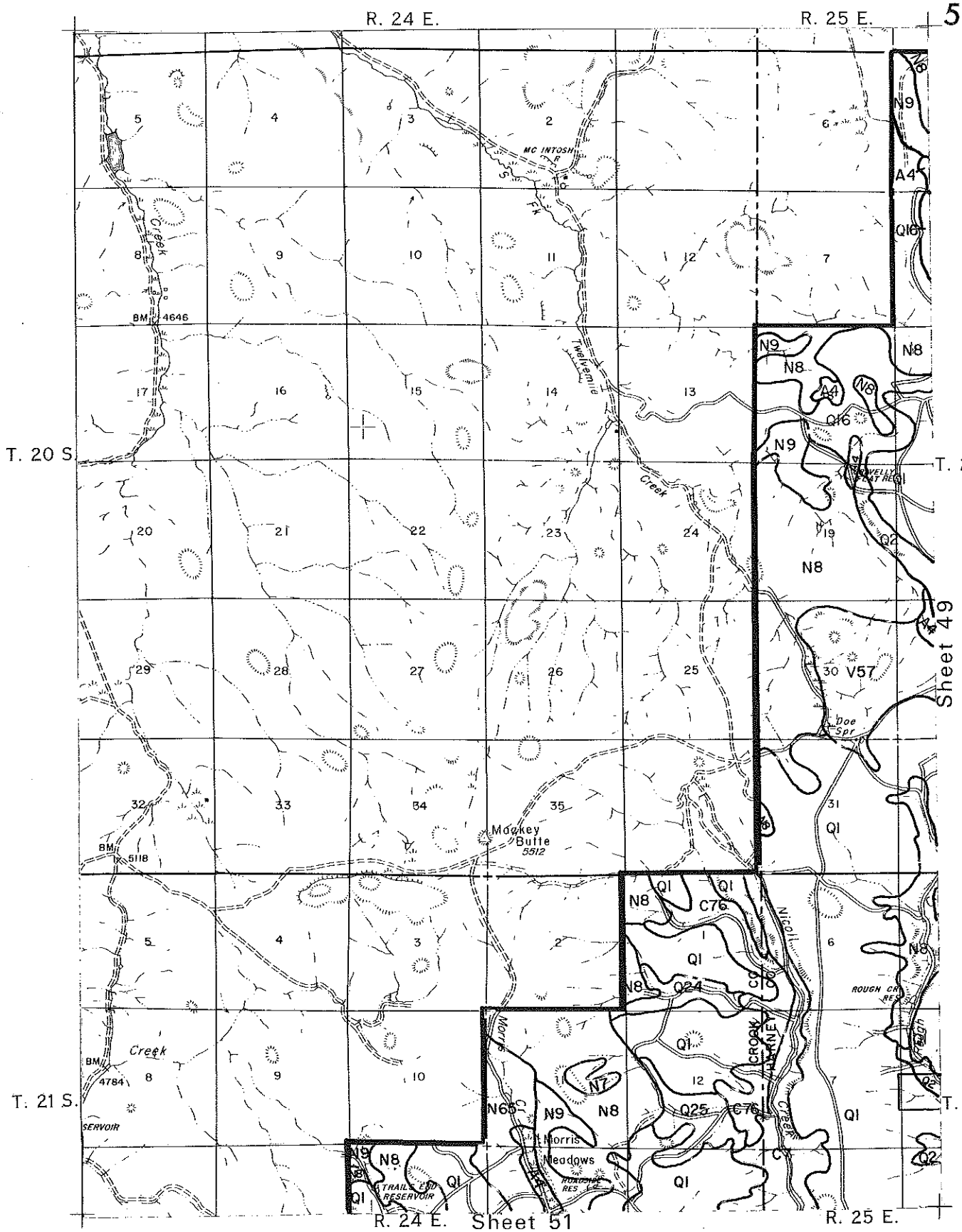
SW Sawtooth Creek Quadrangle
Scale 1"=1 Mile
Contour Interval 40 ft.



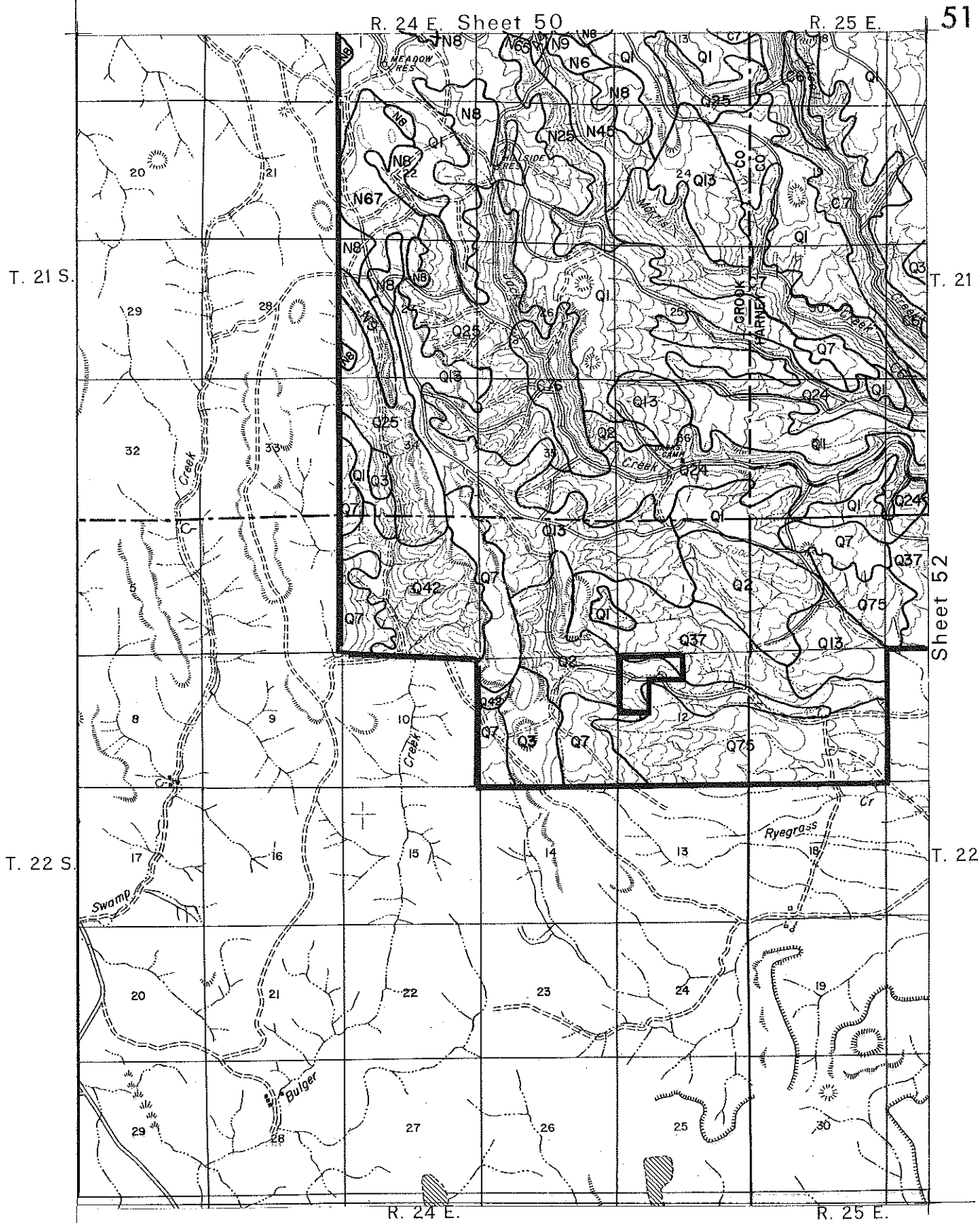
SE Delintment Lake Quadrangle
Scale 1"= 1 Mile
Contour Interval 40 ft.



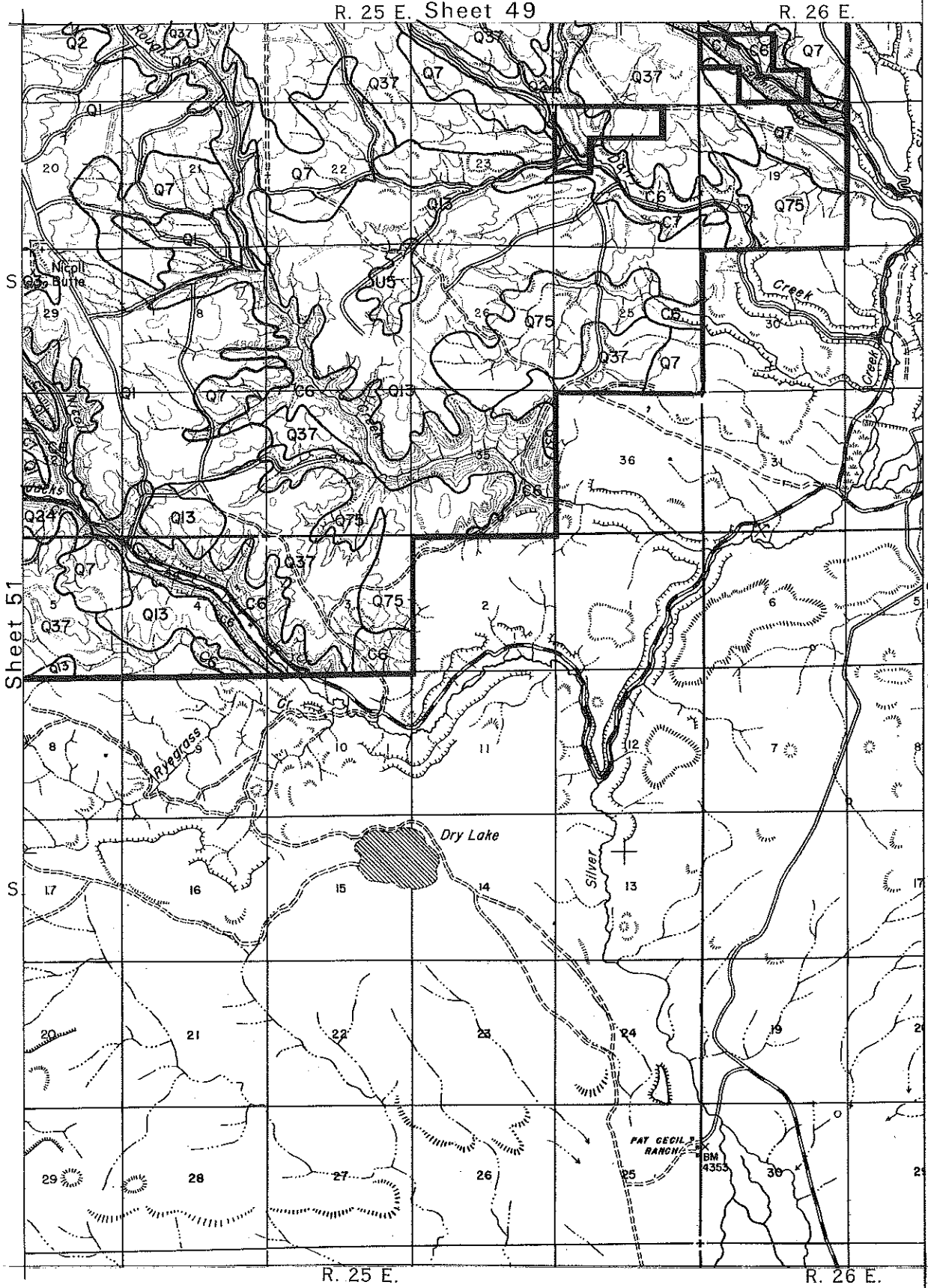
SW Delintment Lake Quadrangle
Scale 1″=1 Mile
Contour Interval 40 ft.



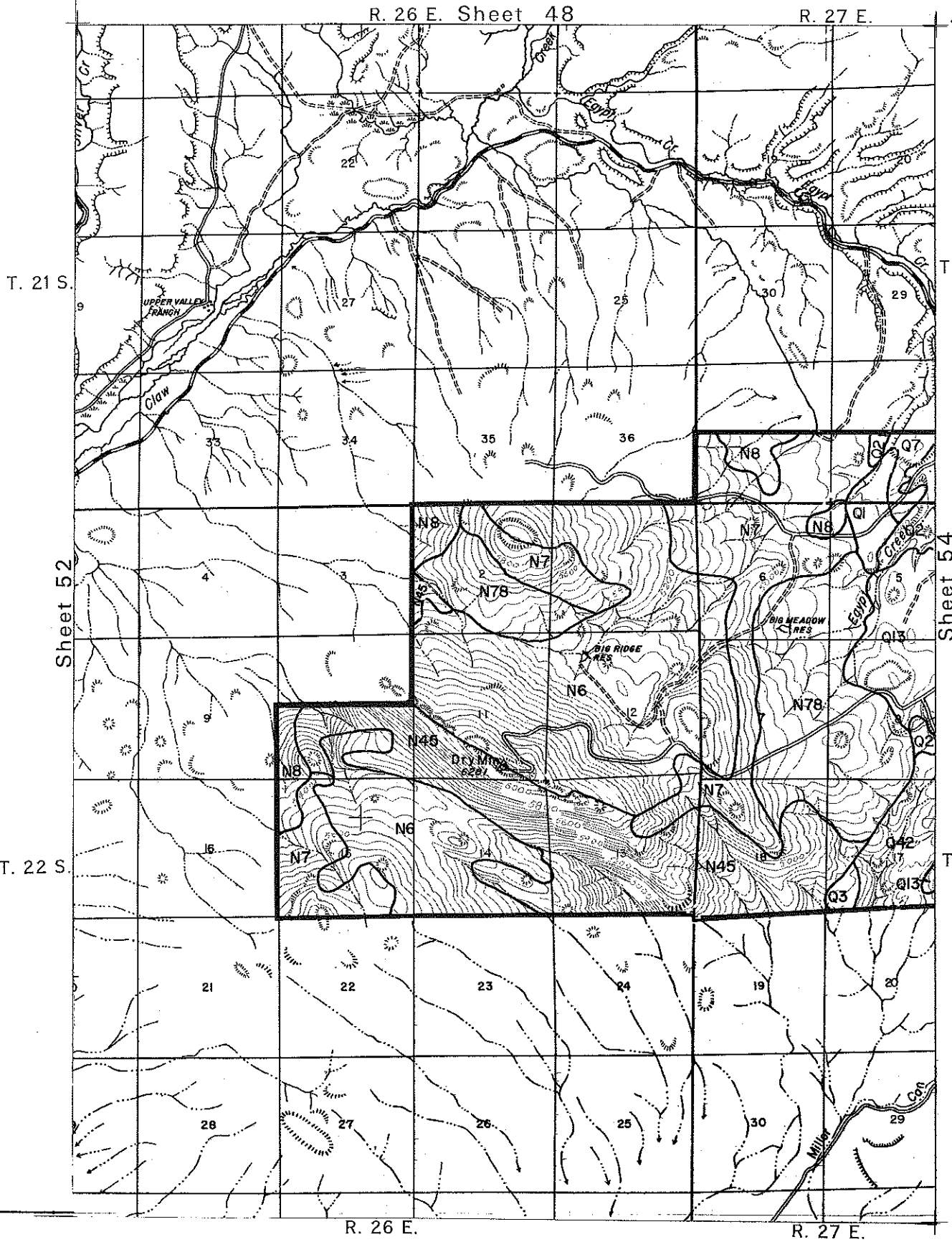
SE Riley 2 Quadrangle
Scale 1"=1 Mile



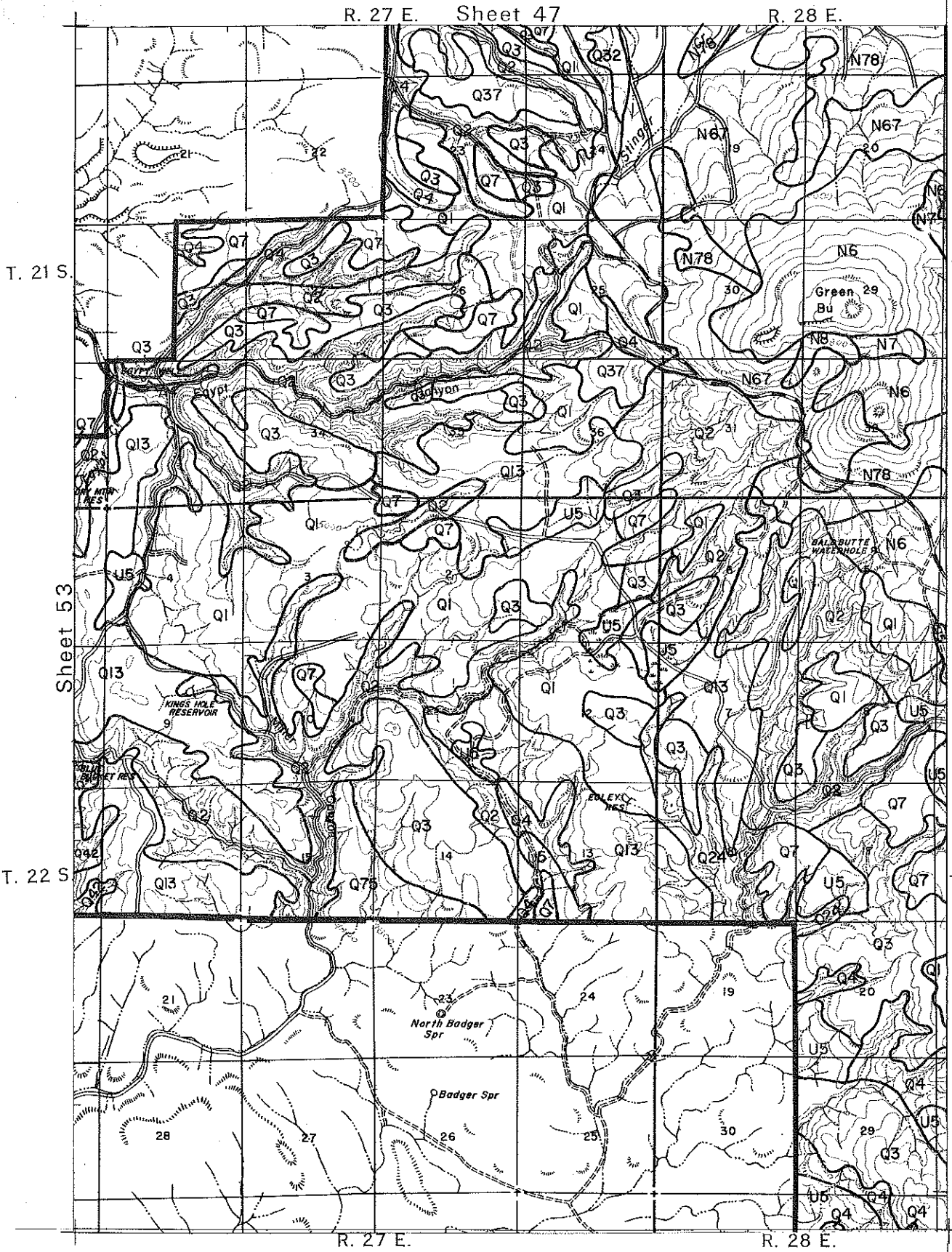
NE Riley 3 Quadrangle
Scale 1″=1 Mile
Contour Interval 40 ft.



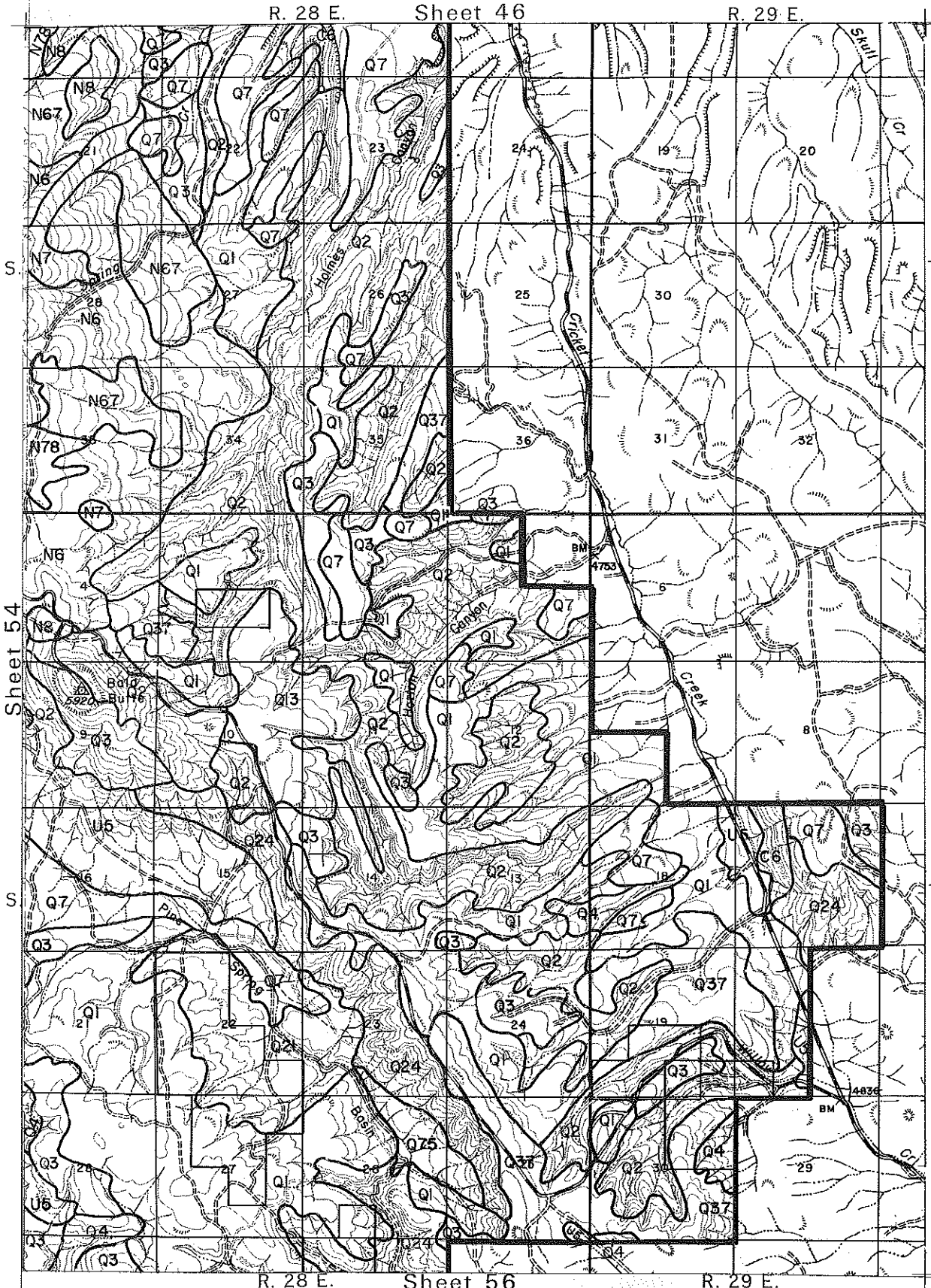
NW Riley 4 Quadrangle
Scale 1"=1 Mile
Contour Interval 40 ft.



NE Riley 4 Quadrangle
Scale 1"= 1 Mile
Contour Interval 40 ft.



NW Burns 3 Quadrangle
Scale 1"=1 Mile
Contour Interval 40 ft.



NE Burns 3 Quadrangle
Scale 1"=1 Mile
Contour Interval 40 ft.

Sheet 54 R. 28 E. Sheet 55

R. 28 E.

SE Burns 3 Quadrangle
Scale 1"= 1 Mile
Contour Interval 40 ft.