

**Rock Creek Area
Ecological Unit Inventory**

Hat Creek Ranger District

Prepared for

Lassen National Forest
Pacific Southwest Region
Forest Service
United States Department of Agriculture

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1. INTRODUCTION

Wise land use is based on ecological principles. It requires knowledge of all aspects of natural environments, or ecosystems and landscapes. This report describes ecological units at the landscape scale (Landtype Association, Order 3) for the Rock Creek Area, Hat Creek Ranger District, Lassen National Forest, California.

1.1 THE ECOLOGICAL UNIT INVENTORY APPROACH

An ecosystem is the basic unit of ecology (Evans 1956). All organisms in a "natural area" (Cain 1947), or environment, along with the rock, soil, water, and atmosphere that they inhabit, comprise an ecosystem. Rowe (1988) stressed the importance of the commonly neglected abiotic aspects of "natural areas" by referring to them as "terrain ecosystems." Ecosystems, or "natural areas," can be identified and described at different levels of detail (Evans 1956; Cain 1947). It is convenient, in ecological mapping, to consider ecosystems as relatively homogeneous natural plant communities on specific landforms with specific soils, and to consider landscapes as delineable geographic features (map polygons) containing one or more ecosystems.

Ecosystems differ from one place to another. They must be described and characterized for land management planning. If a planning area spans more than one relatively homogeneous ecosystem, which is the usual case, the ecosystems, or the landscapes they are in, must be located on a map. And the ecosystems must be classified to make a legend for the map. That is the role of ecological mapping, or ecological unit inventory (USDA, Forest Service Handbook 2090.11), which is essential for prudent and effective land management planning. Ecological management is the current policy of federal land management agencies in the U.S.A.

Ecological unit maps are basic information for ecological management. Mapping is essential, because plot data alone do not provide the spatial information necessary for planning. Soils, vegetation, and other ecosystem components have generally been mapped separately; whole ecosystems, including both abiotic and biotic aspects, have seldom been the objects of mapping. The methods of mapping *whole* ecosystems might be considered a refinement of land systems inventory, as described by Christian (1958) and Wertz and Arnold (1972).

1.1.1 The Nature of Ecological Map Units

The units of ecological mapping (EUI) are geobiotic landscape units. The most basic landscape elements are *ecological types* (ETs), or ecosystems. These landscape elements, however, include more of the lithosphere than is common ecological practice for ecosystems. Each ET has a unique combination of geology, landform, soil, and natural plant communities. Both soils and vegetation are dependent upon the geology (lithology), landforms (relief and drainage), climate, and plant and animal genetic pools (Major 1951). Thus, the spatial distribution patterns of the soil and vegetation components of ecosystems are similar. Landform and soil boundaries are generally natural plant community boundaries. If natural plant communities, rather than current vegetation, are the plant components of ETs, the community boundaries generally correspond to landform and soil boundaries. Animal communities are not considered in mapping, because it is assumed that the natural plant community is a more basic biotic feature of ecosystems.

Each map delineation, or polygon, of EUI is assigned to an ecological map unit (EMU). Thus, an EMU is a map unit class represented by one or more delineations on aerial photographs and maps (Alexander 1994).

In smaller scale (larger area) EUI, where the smallest delineations are > 5 hectares, few delineations and EMUs that represent them contain just one ET that is dominant. Therefore, the EMUs of small-scale mapping are generally *associations* of ETs, because the ETs can usually be delineated separately on detailed maps where the smallest delineations are about two hectares. This meaning of *associations* is from soil survey in which the map unit components are only soil series, or other classes of soils, rather than ETs.

1.1.2 Forest Service EUI Hierarchy

Regional and national land management planners are interested in fitting ecological map units into a system with broadly defined units that can be shown on small-scale maps of large regions, larger than counties or Forests. The Forest Service has adopted an Ecoregion hierarchy proposed by Bailey (1980), even though it lacks some essential features of EUI. The categories, or levels of detail in the hierarchy, are Domain-Division-Province-Section-Subsection, and below Subsection - Landtype Association and Landtype. Bailey (1980) differentiated and named Ecoregion units at all levels down to the section level in the hierarchy, based on climate. Only recently have Ecoregion subsections been proposed for California. The criteria for the subsections are generally geology and climate; they are still being refined in California.

This EUI of the Rock Creek area is at the land-type association level of detail. All of it is in Ecoregion subsection M261Dj, Hat Creek Rim, of the Southern Cascades Section.

2. METHODS OF INVENTORY

Distinct topographic features and vegetation types larger than about 25 acres (10 ha) if contrasting, or larger than 50 acres (20 ha) if noncontrasting, were delineated on aerial photographs. Vegetation types delineated prior to field checking were differentiated by physiognomy. The main physiognomic classes were forest, shrubs, and grassland. White oak woodland was separated from conifer, or conifer and black oak, forest.

Provisional ETs were postulated after a brief field visit to each EMU, and plots (0.1 acre) were selected to represent ETs. ETs were characterized and described from one complete plot description in each and from unrecorded field observations and informal notes.

After field work was completed and a final legend was chosen, delineations (polygons) were transferred to 1:24,000 topographic maps of the Burney Falls, Skunk Ridge, and Burney Quadrangles. The legend is represented by a table of Ecological Map Unit Composition in this report, Chapter 4.

Lithology was described and identified by codes (Haskins and Chatoian, 1993); landforms were described and presumed processes were identified by codes (Haskins and Chaoian, 1993); soils were described utilizing standard terminology (Soil Survey Division Staff, 1993) and classified to the family level (Soil Survey Staff, 1994), although only subgroups were generally identified in ET names; potential natural plant communities were described and identified at the series or a lower level, but not at the plant association level.

3. NATURAL RESOURCES OF THE AREA

3.1 ECOREGION SECTION AND SUBSECTION

All of the Rock Creek area is in the Hat Creek Rim Subsection (M261Dj) of the Southern Cascades Section. There are three parts to the EUI area that is named by the Rock Creek area, which is the largest of the three parts: Rock Creek area north of the Pit River, between Screwdriver Creek and Lake Britton; Long Valley Mountain area south of the Pit River and west of Long Valley Mountain; and Cayton Flat area north of Lake Britton. This area of three parts is between the Soldier Mountain Fault, which is north of the Hat Creek Rim and separates this area of the Southern Cascades from the Modoc Plateau Section of the Basin and Range Province on the east, and the Klamath Mountains Section, which is only a few miles west of the Rock Creek area. The Southern Cascades Section is narrow in the Rock Creek area, where the breadth of the Cascade Range is constricted by the Klamath Mountains on the west.

3.2 GEOLOGY

Geology is the story of the earth as interpreted by its rocks and surficial deposits. It begins with the oldest rocks and is continuing today. The southern Cascade Range, south of central Washington, is a very thick pile of Cenozoic volcanic rocks. There were two major episodes of deposition (McDonald, 1966; Hammond, 1979): (1) a Western Cascade Group and (2) a High Cascade Group. The Western Cascade Group consists of Eocene to early Pliocene andesite and andesitic to rhyodacitic volcanoclastic deposits, with little basalt. These deposits are slightly to moderately deformed, with strata dipping about 5 to 45°, and they are faulted and fractured, locally. The High Cascade Group is much thinner, on the order of 0.5 km thick. It consists of Pliocene and Quaternary basalt and mafic andesite that has not been deformed. There are some stratovolcanoes, such as Mt. Shasta, with more silicic volcanic rocks.

Rocks exposed in the canyon of the Pit River below Lake Britton are largely andesite but include andesitic to more silicic breccias, tuff-breccias, and tuffs. There are thick clastic lacustrine sediment and diatomite strata in the upper part of this sequence. The diatomite is at least middle Pliocene, or older, based on diatoms identified in the diatomite (Aune, 1964). These volcanic rocks and lacustrine deposits are the parent materials of soils on the hilly bench or plateau on the north side of the Pit River canyon, from Screwdriver Creek to Delucci Ridge and the north side of Lake Britton. Landforms on this bench, or plateau, have been eroded over thousands of years and are no longer flat; they are called hills where steep and hillocks where gently sloping to moderately steep. EMUs 351, 352, 353, and 354 are on these hills and hillocks.

Rocks above the Delucci Ridge bench or plateau are mafic volcanic rocks that are designated Miocene basalt on the Alturas Sheet (Gay and Aune, 1958) and Pliocene basalt on the Westwood Sheet (Lydon, et al., 1960) of the Geologic Map of California. They are represented by several flows, both north and south of the Pit River, that have been modified by erosion but still have nearly level plateau and bench surfaces. The plateaus and benches appear to be undissected flow surfaces; each bench being bounded below by the edge of the flow it is on and above by the edge of a flow that partly covered that flow. There is a sequence of plateaus and benches represented from low to high by EMUs 321 and 322, 332, 334, and 336.

Rocks designated Miocene basalt (Gay and Aune, 1958) overlay those of the Pit River sequence, at least on the north side of Lake Britton. If the Miocene age is correct, then volcanic rocks and lacustrine deposits of the Pit River sequence must belong in the Western Cascade Group (Hammond, 1979). This is likely true even if the basalt north of the Pit River is Pliocene rather than Miocene. Basalt above the Pit River sequence, both north and south of the River are more typical of the High Cascade Group, which is Pliocene and Quaternary.

Mass wasting is common in all ETs with steep and very steep slopes, but colluvial deposits are predominant only in EMUs 330 and 339 in the inner-gorge of the Pit River. They are mainly talus and debris flow deposits there. There is a conspicuous slump in EMU 353 (SW ¼ of sec.

17, 37N, R3E) where Cayton Creek has cut deeply into diatomite, causing it to collapse under the edge of the basalt of Cayton Flat.

Fluvial deposits were mapped along the Pit River (EMU 360), around the edge of Goose Valley (EMU 361), along Peavine Creek (EMU 362), and in small basins on the plateau east of Peavine Creek (EMU 363). Sediments in the small basins may be mostly or partly lacustrine.

3.3 CLIMATE

The climate of Rock Creek EUI area ranges from warm continental at lower altitudes to cold continental at higher altitudes. An isohyetal map (USGS, 1969) indicates a mean annual precipitation range from about 40 inches at lower altitudes north of Lake Britton to about 70 inches in the upper part of the Rock Creek watershed. Most of the precipitation falls as snow, during winter months. There are a few thunder storms in late spring and early summer.

3.4 SOILS

Soils of the Rock Creek area range from young on floodplains to moderately old on gently sloping plateaus and broad ridges. The main processes of soil development are organic acid and bicarbonate weathering, leaching of dissolved constituents, translocation of clay from the surface to the subsoil, and accumulation of organic matter. Soils were described by USDA terminology (Soil Survey Division Staff, 1993) and mapped and classified at the suborder or family level, although only subgroups appear in the ET names. The soils are Entisols, Inceptisols, Andisols, Mollisols, Vertisols, and Alfisols (Soil Survey Staff, 1994). Practically all of them are well to excessively well drained, with only minor exceptions, except in EMU 363.

Climate is an important factor as indicated by an altitude sequence of relatively mature soils on basalt from 3200 feet with precipitation about 40 inches/year to 5200 feet with precipitation about 70 inches/year. Soils in the sequence are, from lower to higher elevations, Vitrandic Palexeralfs - Andic Palexeralfs - Andic Palehumults - Ultic Haploxerands - Humic Haploxerands. This sequence might be extended to Vitrandic Argixerolls on the lower end and to Melanoxerands on the upper end. Ultic Argixerolls and Typic and Pachic Melanoxerands were mapped in adjacent areas (Ferrari et al., 1992), but none were found in the Rock Creek EUI.

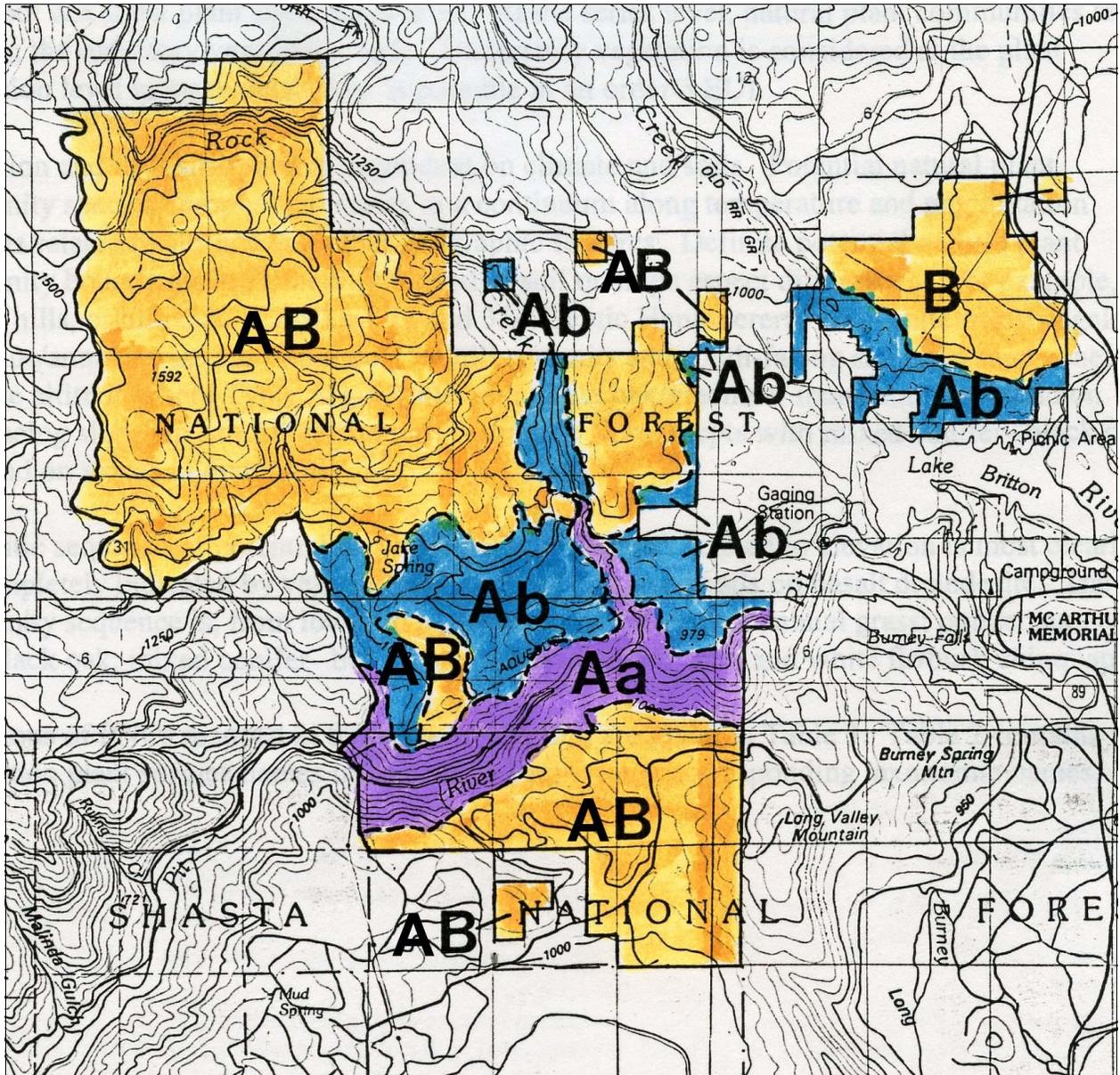
3.5 VEGETATION

Potential natural plant communities (PNCs) were mapped and designated at the series and lower levels, but not at the plant association level. At the series level, natural plant communities are based on the overstory vegetation, only. Understory vegetation is considered at the plant association level in more detail than is possible in an order 3 EUI.

Vegetation and its distribution is dependent on climate and soils. Potential natural plant community species composition varies in a continuum along temperature and precipitation gradients related to altitude and other geographic features. Definite potential natural plant community boundaries are generally related to soil or slope aspect differences. For example, in the low hills, or hillocks, of EMUs 352 and 354, Leptic Haploxererts with white oak/wedgeleaf ceanothus/annual grass are found only on hill summits and south-facing slopes in sandstone, at the same altitude where only Vitrandic Xerochrepts with mixed conifer--black oak are found on slopes in diatomite.

Definitions of PNCs mapped in the Rock Creek EUI are given in Table 1. Table 2 contains a list of common plant species names utilized in this report and corresponding taxonomic names.

Figure 1. Major geologic units of the Rock Creek area.



- AB Andesite or basalt flow rocks and breccias of strata inlined slightly toward the southeast
- Aa Andesitic rocks of very steep Pit River inner gorge slopes
- Ab Andesitic rocks and sediments, including diatomite, of gently sloping to moderately steep and steep slopes
- B Basaltic rocks of gentle to gently sloping flow surfaces and steep flow edges and canyon sides

Table 1. Potential Natural Plant Community (PNC) Definitions (based on crown cover area/total area, and regeneration potential).

| PNC Name / Definition |
|---|
| Barren plant cover < 1% |
| Birchleaf Mtn. Mahogany/Annual Grass tree cover < 10% shrub cover > 10%, dominant shrub is birchleaf mountain mahogany annual grass cover > 20% |
| Canyon Live Oak tree cover > 50%, predominantly canyon live oak conifers < 5% |
| Douglas-Fir--Canyon Live Oak Douglas-fir > 40%, no more than 1 other conifers > 5% canyon live oak > 10% |
| Marsh nonforest, predominantly herbaceous, vegetation of wet areas |
| Mixed Conifer--Black Oak tree cover > 75% each of 3 or more mixed conifer species ^a > 5% each black oak > 10% |
| Ponderosa Pine--Black Oak ponderosa pine > 40%, no more than 1 other conifer > 5% black oak > 10% |
| Ponderosa Pine--White Oak ponderosa pine > 20%, no other conifer > 10% white oak > 20%, black oak < 10% |
| Riparian riparian (stream-side) plant cover > 75% |
| Riparian/Barren riparian (stream-side) plant cover ^b > 5% plant cover absent > 25% |
| White Fir--Black Oak tree cover > 75% white fir > 20%, no more than 1 other conifer > 10% white predominant conifer in understory black oak > 5% |
| White Fir/Bush Chinquapin white fir > 60%, no more than 1 other conifer > 10% black oak < 5% bush chinquapin dominant shrub |
| White Fir/Vine Maple white fir > 60%, no more than 1 other conifer > 10% black oak < 5% vine maple dominant shrub |
| Wedgeleaf Ceanothus/Annual Grass tree cover < 10% shrub cover > 20%, predominantly wedgeleaf ceanothus annual grass > 40%, unless limited by disturbance |
| White Oak/Annual Grass white oak > 40% |

shrubs < 20%

annual grass > 20%

White Oak/Birchleaf Mountain Mahogany

oak trees > 10%, all or predominantly white oak

shrubs > 40%, predominantly birchleaf mountain mahogany

annual grass < 40%

White Oak/Birchleaf Mtn. Mahogany/Annual Grass

oak trees > 10%, all or predominantly white oak

shrubs > 20%, predominantly birchleaf mountain mahogany

annual grass > 40%

White Oak/Deerbrush

trees > 60%, predominantly white oak

conifers < 5%

shrubs > 5%, predominantly deerbrush, or deerbrush and skunkbrush

White Oak/Greenleaf Manzanita

trees > 20%, predominantly white oak

shrubs > 40%, predominantly greenleaf manzanita

White Oak/Skunkbrush

white oak > 20%

shrubs > 20%, predominantly skunkbrush

White Oak/Wedgeleaf Ceanothus/Annual Grass

white oak > 10%

shrubs > 20%, predominantly wedgeleaf ceanothus

forbs > 20%, predominantly annual grass

^a Mixed conifer species, in this area: ponderosa pine, incense-cedar, Douglas-fir, sugar pine, and white fir.

^b Riparian plant cover: trees, shrubs, and herbs on, or adjacent to, floodplains

Table 2. Plants referred to by common name.

| Common Name | Taxonomic Name |
|------------------------------|---|
| alder (shrub) | <i>Alnus incana ssp. tenuifolia</i> |
| alder (tree) | <i>Alnus rhombifolia</i> |
| ash (<i>see</i> Oregon ash) | |
| aspen | <i>Populus tremuloides</i> |
| Bach's downingia | <i>Downingia bacigalupii</i> |
| birchleaf mountain mahogany | <i>Cercocarpus betuloides</i> |
| bitter-cherry | <i>Prunus emarginata</i> |
| black oak | <i>Quercus kelloggii</i> |
| bush chinquapin | <i>Chrysolepis sempervirens</i> |
| canyon live oak | <i>Quercus chrysolepis</i> |
| cheatgrass | <i>Bromus tectorum</i> |
| cottonwood | <i>Populus balsamifera ssp. trichocarpa</i> |
| deerbrush | <i>Ceanothus integerrimus</i> |
| Douglas-fir | <i>Pseudotsuga menziesii</i> |
| greenleaf manzanita | <i>Arctostaphylos patula</i> |
| huckleberry oac | <i>Vaccinium ovatum</i> |
| juniper, western | <i>Juniperus occidentalis occidentalis</i> |
| incense-cedar | <i>Calocedrus decurrens</i> |
| Japanese chess | <i>Bromus japonicus</i> |
| Jeffrey pine | <i>Pinus jeffreyi</i> |
| little prince's pine | <i>Chimaphila menziesii</i> |
| lodgepole pine | <i>Pinus contorta</i> |
| mountain misery | <i>Chamaebatia foliolosa</i> |
| mountain whitethorn | <i>Ceanothus cordulatus</i> |
| Oregon ash | <i>Fraxinus latifolia</i> |
| pine-drops | <i>Pterodroma andromedea</i> |
| pipsissewa | <i>Chimaphila umbellata</i> |
| ponderosa pine | <i>Pinus ponderosa</i> |
| Ross sedge | <i>Carex rossii</i> |
| rush | <i>Juncus sp.</i> |
| sedge | <i>Carex sp.</i> |
| serviceberry, western | <i>Amalanchier utahensis</i> |
| skunkbrush | <i>Rhus trilobata</i> |
| snowbrush | <i>Ceanothus velutinus</i> |
| soft chess | <i>Bromus hordeaceus</i> |
| spiraea | <i>Spiraea douglasii</i> |
| spreading snowberry | <i>Symphoricarpus mollis</i> |
| sqwawcarpet | <i>Ceanothus prostratus</i> |
| sugar pine | <i>Pinus lambertiana</i> |
| vine maple | <i>Acer circinatum</i> |
| wedgeleaf ceanothus | <i>Ceanothus cuneatus</i> |
| white oak | <i>Quercus garryana garryana</i> |
| willow | <i>Salix sp.</i> |
| white fir | <i>Abies concolor</i> |
| white-veined wintergreen | <i>Pyrola picta</i> |
| yampah | <i>Perideridia (bolanderi?)</i> |

4. ECOLOGICAL MAP UNITS

A complete EMU designation number consists of the subsection code plus the local code assigned for the EUI of the Rock Creek area (for example, M261Dj-330), but only the local codes are generally utilized in this report. The maps of EMUs are on 1:24,000 scale USGS topographic map sheets, which are on file at the Lassen National Forest.

Each Ecological Mapping Unit is given a local name for convenience, such as, Pit River Nonforested Inner-Gorge. Most EMUs contain more than one Ecological Type. For example, EMU 330 contains:

EMU PIT RIVER NONFORESTED INNER-GORGE, 60 to 85% Slopes

ET Andesite Inner-Gorge - Pachic Haploxerolls - White Oak/Skunkbrush
and

ET Andesite Inner-Gorge - Lithic Xerorthents - Birchleaf Mountain Mahogany/annual grass

and

ET Andesite Inner-Gorge - Mollic Haploxeralfs - White Oak/Deerbrush

The EMU name contains a local area name followed by the representative Ecological Types, with the ETs being separated by the word *and*. The EMU name also includes the slope range in percent. Thus, the complete name for an EMU contains the ETs, slope gradient. For example, EMU 330 in Table 3 is:

330 PIT RIVER NONFORESTED INNER-GORGE, 60-85% slopes: Andesite Inner-Gorge - Pachic Haploxerolls - White Oak/Skunkbrush *and* Andesite Inner-Gorge - Lithic Xerorthents - Birchleaf Mountain Mahogany/annual grass *and* Andesite Inner-Gorge - Mollic Haploxeralfs - White Oak/Deerbrush.

For convenience, the EMU numbers were grouped by lithology as follows:

| Group | Lithology Primary/Secondary |
|---------|--|
| 320-339 | igneous extrusive/andesite and basalt |
| 350-359 | interbedded igneous extrusive (andesite and basalt) and sedimentary (conglomerate, sandstone, and diatomite) strata |
| 360-369 | unconsolidated fluvial and lacustrine deposits |

| <u>Code</u> | <u>General Name, slope gradient: Geology - Soils - Plant Community (PNC)</u> |
|-------------|--|
| 321 | CAYTON FLAT NONFOREST, 0–12% slopes: basalt plateau - Lithic Ruptic-Haplic Argixerolls - wedgeleaf ceanothus/annual grass, <i>and</i> basalt plateau - Vitrandic Haploxeralfs - white oak/annual grass, <i>and</i> basalt plateau - Vitrandic Palexeralfs - ponderosa pine--black oak |
| 322 | CAYTON FLAT FOREST, 0–12% slopes: basalt plateau - Vitrandic Palexeralfs - ponderosa pine--black oak, <i>and</i> basalt plateau - Vitrandic Haploxeralfs - white oak/annual grass, <i>and</i> basalt plateau - Lithic Ruptic-Haplic Argixerolls - wedgeleaf ceanothus/annual grass |
| 330 | PIT RIVER NONFORESTED INNER-GORGE, 60–85% slopes: andesite inner-gorge - Pachic Haploxerolls - white oak/skunkbrush, <i>and</i> andesite inner-gorge - Lithic Xerorthents - birchleaf mountain mahogany/annual grass, <i>and</i> andesite inner-gorge - Mollic Haploxeralfs - white oak/deerbrush |
| 331 | JAKE SPRING MOUNTAIN SIDESLOPE, 25–60% slopes: andesite or basalt mountain sideslopes - Vitrandic Haploxeralfs - mixed conifer--black oak, <i>and</i> andesite or basalt mountain sideslopes - Vitrandic Palexeralfs - mixed conifer--black oak |
| 332 | JAKE SPRING PLATEAU, 6–30% slopes: andesite or basalt plateau - Vitrandic Palexeralfs - mixed conifer--black oak, <i>and</i> andesite or basalt mountain sideslopes - Vitrandic Haploxeralfs - mixed conifer--black oak |
| 333 | SUMMIT LAKE MOUNTAIN SIDESLOPE, 25–60% slopes: andesite or basalt mountain sideslopes - Humic Haploxerands - white fir--black oak, <i>and</i> andesite or basalt mountain sideslopes - Andic Haplohumults - white fir--black oak |
| 334 | SUMMIT LAKE PLATEAU, 6–30% slopes: andesite or basalt plateau - Andic Paleohumults - white fir--black oak, <i>and</i> andesite or basalt mountain sideslopes - Andic Haplohumults - white fir--black oak |
| 335 | SQUAW FLAT MOUNTAIN SIDESLOPE, 25–60% slopes: andesite or basalt mountain sideslopes - Humic Haploxerands - white fir/vine maple, <i>and</i> andesite or basalt mountain sideslopes - Humic Haploxerands - white fir/bush chinquapin |
| 336 | SQUAW FLAT PLATEAU, 6–30% slopes: andesite or basalt plateau - Humic Haploxerands - white fir/bush chinquapin, <i>and</i> andesite or basalt plateau - Ultic Haploxerands - white fir/bush chinquapin, <i>and</i> andesite or basalt plateau - Humic Haploxerands - white fir/vine maple |
| 337 | JAKE SPRING NONFOREST, 25–60 slopes, S-facing: andesite or basalt mountain sideslopes - Typic Argixerolls - white oak/birchleaf mountain mahogany/annual grass, <i>and</i> andesite or basalt mountain sideslopes - Ultic Argixerolls - white oak/birchleaf mountain mahogany, <i>and</i> andesite or basalt mountain sideslope - Lithic Argixerolls - wedgeleaf ceanothus/annual grass |
| 339 | PIT RIVER FORESTED INNER-GORGE, 60–85% slopes: andesite inner-gorge - Typic Xerochrepts - Douglas-fir--canyon live oak, <i>and</i> andesite inner-gorge - Lithic Mollic Haploxeralfs - canyon live oak, <i>and</i> andesite inner-gorge - fragmental colluvium - barren |
| 351 | DELUCCI NONFORESTED SIDESLOPES, 25–60% slopes, S-facing: andesite or basalt hill slopes - Lithic Argixerolls - wedgeleaf ceanothus/annual grass, <i>and</i> andesite or basalt hill slopes - Typic Argixerolls - white oak/birchleaf mountain mahogany/annual grass, <i>and</i> andesite or basalt hill slopes - Ultic Argixerolls - white oak/birchleaf mountain mahogany, <i>and</i> clastic sedimentary hill slopes - Typic Argixerolls - white oak/greenleaf manzanita |
| 352 | DELUCCI NONFORESTED HILLOCKS, 3–30% slopes: andesite or basalt hillocks - Typic Argixerolls - white oak/birchleaf mountain mahogany/annual grass, <i>and</i> clastic sedimentary hillocks - Typic Argixerolls - white oak/greenleaf manzanita, <i>and</i> sandstone hillocks - Leptic Haploxererts - white oak/wedgeleaf ceanothus/annual grass |

- 353 DELUCCI FORESTED HILLS, 25–60% slopes: andesite or basalt hill slopes - Vitrandic Haploxeralfs - mixed conifer--black oak, *and* diatomite hill slopes - Vitrandic Xerochrepts - mixed conifer--black oak, *and* clastic sedimentary hill slopes - Vitrandic Haploxeralfs - mixed conifer--black oak
- 354 DELUCCI FORESTED HILLOCKS, 3–30% slopes: andesite or basalt hillocks - Vitrandic Haploxeralfs - mixed conifer--black oak, *and* diatomite hillocks - Vitrandic Xerochrepts - mixed conifer--black oak, *and* andesite or basalt over clastic sedimentary hillocks - Vitrandic Xerochrepts - mixed conifer--black oak
- 360 PIT RIVER ALLUVIAL FLATS, 0–3% slopes: stream terraces - Xerochrepts & Haploxerolls - mixed conifer--black oak, *and* stream terraces - Haploxeralfs & Xerochrepts - mixed conifer--black oak
- 361 GOOSE VALLEY FAN SKIRT, 1–6% slopes: bajada fan skirt - Haploxeralfs - ponderosa pine--white oak
- 362 PEAVINE CREEK FLOODPLAIN, 0–3% slopes: floodplain - Umbrepts - riparian
- 363 SQUAW FLAT BASIN, 0–1% slopes: basin-fill - Aquepts - marsh
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TABLE 4 ECOLOGICAL MAP UNIT COMPOSITION

| Map Unit* Slope Grad. Ecoregion and Alt.(ft) | Ecol. Type no. ^b | Area | Slope Aspect, Grad. | Lith. ^c Pri./Sec. | Geomorph. ^d Type-Proc. | Soil Class | Plant Community |
|---|-----------------------------------|------|------------------------|---------------------------------|--------------------------------------|----------------------------------|--------------------------------------|
| 321 | CAYTON FLAT NONFOREST | | | | | | |
| 0-12% | 1 | 60% | all, 1-6% | V/B | F-EH | Lithic Ruptic-Haplic Argixerolls | Wedgeleaf Ceanothus/Annual Grass |
| M261Dj | 2 | 20% | all, 2-9% | V/B | F-EH | Vitrandic Haploxerafls | White Oak/Annual Grass |
| 3120-3400 | 3 | 10% | all, 2-12% | V/B | F-EH | Vitrandic Palexerafls | Ponderosa Pine--Black Oak |
| | Incl. | 10% | | | | | |
| 322 | CAYTON FLAT FOREST | | | | | | |
| 0-12% | 1 | 60% | all, 2-12% | V/B | F-EH | Vitrandic Palexerafls | Ponderosa Pine--Black Oak |
| M261Dj | 2 | 20% | all, 2-9% | V/B | F-EH | Vitrandic Haploxerafls | White Oak/Annual Grass |
| 3100-3440 | 3 | 10% | all, 1-6% | V/B | F-EH | Lithic Ruptic-Haplic Argixerolls | Wedgeleaf Ceanothus/Annual Grass |
| | Incl. | 10% | | | | | |
| 330 | PIT RIVER NONFORESTED INNER-GORGE | | | | | | |
| 60-85% | 1 | 40% | S, 60-85% | V/A,B | MW-FL | Pachic Haploxerolls | White Oak/Skunkbrush |
| M261Dj | 2 | 20% | S, 60-85% | V/A,B | F-EH | Lithic Xerorthents | Birchleaf Mtn. Mahogany/Annual Grass |
| 2400-3400 | 3 | 20% | N,E 60-85% | V/A,B | MW-FL | Mollic Haploxerafls | White Oak/Deerbrush |
| | Incl. | 20% | | | | | |
| 331 | JAKE SPRING MOUNTAIN SIDESLOPE | | | | | | |
| 25-60% | 1 | 70% | all, 30-60% | V/A,B | UHS | Vitrandic Haploxerafls | Mixed Conifer Black Oak |
| M261Dj | 2 | 20% | all, 25-45% | V/A,B | F-EH | Vitrandic Palexerafls | Mixed Conifer Black Oak |
| 3040-4040 | Incl. | 10% | | | | | |
| 332 | JAKE SPRING PLATEAU | | | | | | |
| 6-30% | 1 | 80% | all, 6-25% | V/A,B | F-EH | Vitrandic Palexerafls | Mixed Conifer Black Oak |
| M261Dj | 2 | 15% | all, 15-30% | V/A,B | F-EH | Vitrandic Haploxerafls | Mixed Conifer Black Oak |
| 3280-4000 | Incl. | 5% | | | | | |

TABLE 4 (continued)

| Map Unit ^a Slope Grad. Ecoregion and Alt.(ft) | Ecol. Type no. ^b | Area | Slope Aspect, Grad. | Lith. ^c Pri./Sec. | Geomorph. ^d Type-Proc. | Soil Class | Plant Community |
|---|-----------------------------------|------|------------------------|---------------------------------|--------------------------------------|--------------------|---|
| 333 | SUMMIT LAKE MOUNTAIN SIDESLOPE | | | | | | |
| 25-60% | 1 | 40% | all, 30-60% | V/A,B | UHS | Humic Haploxerands | White Fir/Black Oak |
| M261Dj | 2 | 40% | all, 25-60% | V/A,B | UHS | Andic Haplohumults | White Fir/Black Oak |
| 320-5040 | Incl. | 20% | | | | | |
| 334 | SUMMIT LAKE PLATEAU | | | | | | |
| 6-30% | 1 | 70% | all, 6-25% | V/A,B | F-EH | Andic Palehumults | White Fir/Black Oak |
| M261Dj | 2 | 20% | all, 15-30% | V/A,B | F-EH | Andic Haplohumults | White Fir/Black Oak |
| 3560-5060 | Incl. | 10% | | | | | |
| 335 | SQUAW FLAT MOUNTAIN SIDESLOPE | | | | | | |
| 25-60% | 1 | 70% | N, 30-60% | V/A,B | UHS | Humic Haploxerands | White Fir/Vine Maple |
| M261Dj | 2 | 20% | all, 25-45% | V/A,B | F-EH | Humic Haploxerands | White Fir/Bush Chinquapin |
| 3920-5280 | Incl. | 10% | | | | | |
| 336 | SQUAW FLAT PLATEAU | | | | | | |
| 6-30% | 1 | 40% | all, 6-25% | V/A,B | F-EH | Humic Haploxerands | White Fir/Bush Chinquapin |
| M261Dj | 2 | 40% | all, 6-25% | V/A,B | F-EH | Ultic Haploxerands | White Fir/Bush Chinquapin |
| 4920-5360 | 3 | 15% | N, 15-30% | V/A,B | F-EH | Humic Haploxerands | White Fir/Vine Maple |
| | Incl. | 5% | | | | | |
| 337 | JAKE SPRING NONFOREST | | | | | | |
| 25-60% | 1 | 40% | S, 25-45% | V/A,B | F-EH | Typic Argixerolls | White Oak/Birchleaf Mountain Mahogany/Annual Grass |
| M261Dj | 2 | 30% | S, 30-60% | V/A,B | UHS | Ultic Argixerolls | White Oak/Birchleaf Mountain Mahogany |
| 3000-3640 | 3 | 20% | S, 30-60% | V/A,B | UHS | Lithic Argixerolls | Wedgeleaf Ceanothus/Annual Grass |
| | Incl. | 10% | | | | | |

TABLE 4 (continued)

| Map Unit ^a Slope Grad. Ecoregion and Alt.(ft) | Ecol. Type no. ^b | Area | Slope Aspect, Grad. | Lith. ^c Pri./Sec. | Geomorph. ^d Type-Proc. | Soil Class | Plant Community |
|---|-----------------------------------|------|------------------------|---------------------------------|--------------------------------------|----------------------------|---|
| 339 | PIT RIVER FORESTED INNER-GORGE | | | | | | |
| 60-85% | 1 | 40% | N, 60-85% | V/A,B | MW-FL | Typic Xerochrepts | Douglas-Fir/Canyon Live Oak |
| M261Dj | 2 | 20% | all, 70-85% | V/A,B | MW-FL | Lithic Mollic Haploxerafls | Canyon Live Oak |
| 2400-3720 | 3 | 20% | all, 70-85% | V/A,B | MW-F,T | fragmental colluvium | Barren |
| | Incl. | 20% | | | | | |
| 351 | DELUCCI NONFORESTED SIDESLOPES | | | | | | |
| 25-60% | 1 | 30% | S, 30-60% | V/A,B | UHS | Lithic Argixerolls | Wedgeleaf Ceanothus/Annual Grass |
| M261Dj | 2 | 20% | S, 25-45% | V/A,B | F-EH | Typic Argixerolls | White Oak/Birchleaf Mountain Mahogany/Annual Grass |
| 2920-3520 | 3 | 20% | S, 30-60% | V/A,B | UHS | Ultic Argixerolls | White Oak/Birchleaf Mountain Mahogany |
| | 4 | 20% | S, 25-45% | S/CG,SS | UHS | Typic Argixerolls | White Oak/Greenleaf Manzanita |
| | Incl. | 10% | | | | | |
| 352 | DELUCCI NONFORESTED HILLOCKS | | | | | | |
| 3-30% | 1 | 40% | S, 3-30% | V/A,B | F-EH | Typic Argixerolls | White Oak/Birchleaf Mountain Mahogany/Annual Grass |
| M261Dj | 2 | 30% | all, 6-30% | S/CG,SS | F-EH | Typic Argixerolls | White Oak/Greenleaf Manzanita |
| 2880-3600 | 3 | 10% | S, 3-25% | S/SS | UHS | Leptic Haploxererts | White Oak/Wedgeleaf Ceanothus/Ann. Grass |
| | Incl. | 20% | | | | | |
| 353 | DELUCCI FORESTED HILLS | | | | | | |
| 25-60% | 1 | 40% | all, 30-60% | V/A,B | UHS | Vitrandic Haploxerafls | Mixed Conifer--Black Oak |
| M261Dj | 2 | 30% | all, 25-60% | S/DI | F-EH | Vitrandic Xerochrepts | Mixed Conifer--Black Oak |
| 2880-3800 | 3 | 20% | all, 25-60% | S/CG,SS | UHS | Vitrandic Haploxerafls | Mixed Conifer--Black Oak |
| | Incl. | 10% | | | | | |

TABLE 4 (continued)

| Map Unit ^a Slope Grad. Ecoregion and Alt.(ft) | Ecol. Type no. ^b | Area | Slope Aspect, Grad. | Lith. ^c Pri./Sec. | Geomorph. ^d Type-Proc. | Soil Class | Plant Community |
|---|-----------------------------------|------|------------------------|---------------------------------|--------------------------------------|------------------------------|---------------------------|
| 354 | DELUCCI FORESTED HILLOCKS | | | | | | |
| 3-30% | 1 | 30% | all, 3-30% | V/A,B | F-EH | Vitrandic Haploxeralfs | Mixed Conifer--Black Oak |
| M261Dj | 2 | 30% | all, 3-30% | S/DI | F-EH | Vitrandic Xerochrepts | Mixed Conifer--Black Oak |
| 2720-3640 | 3 | 30% | all, 3-30% | V/A,B over S/DI | F-EH | Vitrandic Xerochrepts | Mixed Conifer--Black Oak |
| | Incl. | 10% | | | | | |
| 360 | PIT RIVER ALLUVIAL FLATS | | | | | | |
| 0-3% | 1 | 40% | -, 1-3% | U/AL | F-ST | Xerochrepts and Haploxerolls | Mixed Conifer--Black Oak |
| M261Dj | 2 | 30% | -, 1-3% | U/AL | F-ST | Haploxeralfs and Xerochrepts | Mixed Conifer--Black Oak |
| 2400-2620 | Incl. | 30% | | | | | |
| 361 | GOOSE VALLEY FAN SKIRT | | | | | | |
| 1-6% | | | | U/AL | F-BA | Haploxeralfs | Ponderosa Pine--White Oak |
| M261Dj | | | | | | | |
| 3210-3230 | | | | | | | |
| 362 | PEAVINE CREEK FLOODPLAIN | | | | | | |
| 0-3% | | | | U/AL | F-FP | Umbrepts | Riparian |
| M261Dj | | | | | | | |
| 4760-4860 | | | | | | | |
| 363 | SQUAW FLAT BASIN | | | | | | |
| 0-1% | | | | U/AL | F-BO | Aquepts | Marsh |
| M261Dj | | | | | | | |
| 4820 | | | | | | | |

TABLE 4 (continued)

| Map Unit ^a | Slope Grad. | Ecol. Type | Area | Slope Aspect, Grad. | Lith. ^c Pri./Sec. | Geomorph. ^d Type-Proc. | Soil Class | Plant Community |
|-----------------------|-------------|------------|------|---------------------|------------------------------|-----------------------------------|------------|-----------------|
|-----------------------|-------------|------------|------|---------------------|------------------------------|-----------------------------------|------------|-----------------|

- a. Map unit number, followed by its name, which is an aggregation of names for ecological types in the map unit, on the same line; range of slope gradients on the second line; Ecoregion subsection on the third line; and range of altitudes (meters) on the fourth line.
- b. Ecological type number 1 through 2 or 3 within each EMU. Incl.= inclusions.
- c. Lithological primary/secondary codes. S/CG, conglomerate; S/DI, diatomite; S/SS, sandstone; U/AL, alluvium; V/A,B, andesite and/or basalt; V/B, basalt. Refer to Appendix A^c.
- d. Geomorphic type-processes codes. F-BA, bajada; F-BO, bolson; F-EH, fluvial-eroding slope; F-FP, fluvial-flood plain; F-ST, stream terrace; MW-F,T, mass wasting-falls, talus; MW-FL, mass wasting-flow; UHS, many processes, none predominant. Refer to Appendix B^c.
- e. Haskins and Chatoian (1993). *Geology Data Standards for Ecological Unit Inventories of the Pacific Southwest Region*.

5. ECOLOGICAL MAP UNIT AND ECOLOGICAL TYPE DESCRIPTIONS

The Ecological Map Units (EMUs) are described in numerical order. Each EMU description contains a brief description of the map unit, including lithology, followed by descriptions of the Ecological Types (ETs) that occur in the map unit. The ET description consists of information about the geomorphology, soil, and plant community. The EMU composition is outlined in Table 4 (Ecological Map Unit Composition, and the ET descriptions follow in this chapter. The areas of EMUs mapped are shown in Table 5.

Table 5. Areas of the Ecological Map Units

| <u>EUI</u> | <u>Acres</u> | <u>Ha.</u> |
|--------------|---------------|-------------|
| 321 | 617 | 247 |
| 322 | 763 | 305 |
| 330 | 822 | 329 |
| 331 | 2133 | 853 |
| 332 | 2155 | 862 |
| 333 | 1722 | 689 |
| 334 | 1082 | 433 |
| 335 | 1039 | 416 |
| 336 | 2134 | 854 |
| 337 | 841 | 336 |
| 338 | 685 | 274 |
| 351 | 375 | 150 |
| 352 | 490 | 196 |
| 353 | 952 | 381 |
| 354 | 941 | 375 |
| 360 | 250 | 100 |
| 361 | 31 | 12 |
| 362 | 62 | 25 |
| 363 | 11 | 4 |
| Total | 17,105 | 6842 |

321 - CAYTON FLAT NONFOREST, 0-12% slopes

EMU 321 is on a gently to very gently sloping volcanic plateau surrounding Cayton Valley and extending northward. It is terminated on the south by the Pit River canyon.

The bedrock

Lithology - basalt or andesite. This is a late Cenozoic, possibly Miocene (Gay et al, 1958) flow rock that is most likely basalt. Basalt bedrock is very permeable, because of vertical parting to form columnar structure. Most runoff is through the bedrock, rather than overland. Therefore, there are few distinct stream courses on the plateau. There are some small closed basin in which alluvium or lacustrine sediment has accumulated - they are inclusions that are too small to map separately from the upland areas on the plateau.

Map Unit Composition

- 60% ET 321-1 - basalt plateau : Lithic Ruptic-Haplic Argixerolls : wedgeleaf ceanothus/annual grass
- 20% ET 321-2 - basalt plateau : Vitrandic Haploxeralfs : white oak/annual grass
- 10% ET 321-3 - basalt plateau : Vitrandic Palexeralfs : ponderosa pine--black oak
- 10% Inclusions: Lithic Haploxerolls on basalt with annual grass and sparse wedgeleaf ceanothus; moderately deep Haploxerolls on basalt with sparse white oak, wedgeleaf ceanothus, and annual grass; and fine-textured Alfisols in small closed basins with annual herbs.

ET 321-1

basalt plateau : Lithic Ruptic-Haplic Argixerolls : wedgeleaf ceanothus/annual grass

Geomorphology - Fluvial/Eroding Hill Slopes. The landform is a gently sloping volcanic plateau. Fluvial erosion by overland flow of water is the predominant geomorphic process. Chemical denudation by weathering and leaching is also an important geomorphic processes in this ET.

Soils - Lithic Ruptic-Haplic Argixerolls. They are loamy-skeletal, oxidic, mesic Lithic Ruptic-Haplic Argixerolls. These are very shallow A-Bt-R profile soils with a lithic contact to bedrock at 10 to 50 cm depth. They range from very shallow (10-18 cm deep) without argillic horizon to shallow (18-50 cm deep) with argillic horizon in 1 to 3 meter cycles. They are well drained.

Representative Pedon RC12 - W½ sec. 17, T37N, R3E, Burney Falls Quadrangle.

Classification: loamy-skeletal, oxidic, mesic Lithic Ruptic-Haplic Argixeroll

Altitude: 3260 feet

Slope: concave (linear along contour) E 4% smooth

Surface Stoniness: 10% gravel, 7% cobbles, 2% "stones", no boulders

Oi Scattered leaves of shrubs, oak trees, and grass.

A1 0-3 cm; dark reddish brown (5YR 3/3) gravelly loam, reddish brown (5YR 5/5) dry; weak, fine and medium, subangular blocky; slightly hard, slightly sticky, nonplastic; few very fine roots; slightly acid; abrupt, smooth boundary.

A2 3-16 cm; dark reddish brown (5YR 3/3) loam, yellowish red (5YR 5/6) dry; moderate, medium subangular blocky; hard, slightly sticky, slightly plastic; very few very fine and fine roots; moderately to slightly acid; clear, wavy boundary.

Bt 16-38 cm; dark reddish brown (5YR 3/4) extremely gravelly clay loam, yellowish red (5YR 4/6) dry; moderate fine subangular blocky; firm, sticky, plastic; few very fine and fine roots; moderately acid; discontinuous horizon, abrupt, irregular boundary to R-horizon.

R 16/38-40+ hard, highly fractured vesicular basalt at depths ranging from 16 to 38 cm within one to three meters horizontally.

Potential Natural Plant Community - wedgeleaf ceanothus/annual grass. The cover is open shrub and moderately dense grass among the shrubs. It is at least 20% wedgeleaf ceanothus and generally a little birchleaf mountain mahogany. White oak is sparse (< 10%). Soft chess and Japanese chess are common grasses. Annual forbs and cheatgrass, or downy brome grass, are abundant following burning and other site disturbances.

Plants at representative site RC12.

Tree cover, 5%: *Quercus garryana*, 5%. Shrub cover, 40%: *Ceanothus cuneatus*, 30%; and *Cercocarpus betuloides*, 10%. Forb cover, 15%: *Blepharipappus scaber*, 7%; *Monardella lanceolata*, 3%; *Polygonum bidwelliae*, 2%; *Epilobium brachycarpum*, 1%; *Achillea millefolium*, 1%; *Allium* sp, 1%; and *Clarkia rhomboidea* and *Gilia* sp, each < 1%. Graminoid cover, 8%: *Bromus hordeaceus*, 5%; *Bromus japonicus*, 2%; *Bromus tectorum*, 1%; and *Elymus elymoides* < 1%. Many annual forbs were dry and unidentifiable when the site was described on August 11, 1995.

ET 321-2

basalt plateau: Vitrandic Haploxeralfs : white oak--annual grass

Geomorphology - Fluvial/Eroding Hill Slopes. The landform is a gently sloping volcanic plateau. Fluvial erosion by overland flow of water is the predominant geomorphic process. Chemical denudation by weathering and leaching is also an important geomorphic processes in this ET.

Soils - Vitrandic Haploxeralfs. They are moderately deep loamy-skeletal and deep fine-loamy, oxidic, mesic Vitrandic Haploxeralfs. These are moderately deep to deep A-Bt-Cr or R profile soils with a lithic or a paralithic contact to weathered bedrock at 50 to 150 cm depth. They are well drained.

Representative Pedon RC13 - S½, S½, sec. 8, R37N, R3E, Burney Falls Quadrangle.

Classification: fine-loamy, oxidic, mesic Vitrandic Haploxeralfs

Altitude: 3200 feet

Slope: concave (linear along contour) N 8% smooth

Surface Stoniness: 10% gravel, no cobbles, "stones" < 1%, boulders, 1%

Oi 1-0 cm; loose oak and grass leaves.

A1 0-5 cm; dark reddish brown (5YR 3/3) loam, reddish brown (5YR 5/4) dry; moderate, fine granular; soft, slightly sticky, slightly plastic; few very fine roots; slightly acid; clear smooth boundary.

A2 5-21 cm; dark reddish brown (5YR 3/3) loam, reddish brown (5YR 5/4) dry; weak, very fine subangular blocky; slightly hard, friable, sticky, slightly plastic; few fine and medium roots; slightly acid; gradual, smooth boundary.

Bt1 21-52 cm; dark reddish brown (5YR 3/4) gravelly clay loam; moderate, fine subangular blocky; slightly hard, firm, sticky, plastic; discontinuous thin coatings on ped faces; few fine, medium, and coarse roots; slightly acid; gradual, smooth boundary.

Bt2 52-80 cm; dark reddish brown (2.5YR 3/4) gravelly clay loam; weak, medium subangular blocky; very firm, sticky, plastic; continuous thin coatings on ped faces; very few fine, medium, and coarse roots; moderately acid; diffuse boundary.

BC 80-105+ cm; reddish brown (5YR 4/4) very gravelly clay loam; massive; very firm, sticky, plastic; very few fine and medium roots; strongly acid.

Potential Natural Plant Community - white oak--annual grass. The cover is open white to semi-dense oak woodland with dense annual grass among the trees and less than 20% wedgeleaf ceanothus and birchleaf mountain mahogany. Soft chess is a common and abundant grass. Annual forbs and cheatgrass, or downy brome grass, are abundant following burning and other site disturbances.

Plants at representative site RC13.

Tree cover, 60%: *Quercus garryana*, 60%. Shrub cover, 12%: *Ceanothus cuneatus*, 10; and *Cercocarpus betuloides*, 2%. Forb cover, 10%; *Epilobium brachycarpum*, 3%; *Monardella lanceolata*, 4%; *Erigeron inornatus*, 2%; and *Clarkia rhomboidea* < 1%. Graminoid cover, 40%: *Bromus hordeaceus*, 20%; *Bromus tectorum*, 10%; *Vulpia myuros*, 10%; *Achnatherum* sp, 1%; and *Bromus japonicus* and *Elymus elymoides*, each < 1%. White oak seedlings present in understory.

ET 321-3 = ET 322-1

322 - CAYTON FLAT FOREST, 0-12% slopes

EMU 322 is on a gently to very gently sloping volcanic plateau surrounding Cayton Valley and extending northward. It is terminated on the south by the Pit River canyon. The bedrock

Lithology - basalt or andesite. This is a late Cenozoic, possibly Miocene (Alturas sheet, Calif. Div. Mines & Geology) flow rock that is most likely basalt. Basalt bedrock is very permeable, because of vertical parting to form columnar structure. Most runoff is through the bedrock, rather than overland. Therefore, there are few distinct stream courses on the plateau. There are some small closed basin in which alluvium or lacustrine sediment has accumulated - they are inclusions that are too small to map separately from the upland areas on the plateau.

Map Unit Composition

- 60% ET 321-1 - basalt plateau : Vitrandic Palexeralfs : ponderosa pine--black oak
- 20% ET 321-2 - basalt plateau : Vitrandic Haploxeralfs : white oak/annual grass
- 10% ET 321-3 - basalt plateau : Lithic Ruptic-Haplic Argixerolls : wedgeleaf ceanothus/annual grass
- 10% Inclusions: deep Haploxeralfs on basalt with ponderosa pine--black oak; and fine-textured Alfisols in basin-fill with annual herbs.

ET 322-1

basalt plateau: Vitrandic Palexeralfs : ponderosa pine--black oak

Geomorphology - Fluvial/Eroding Hill Slopes. The landform is a gently sloping volcanic plateau. Fluvial erosion by overland flow of water is the predominant geomorphic process. It may be effective, however, only after a catastrophic event, such as a forest fire, that leads to the loss of forest litter covering the soils. Chemical denudation by weathering and leaching is also an important geomorphic processes in this ET.

Soils - Vitrandic Palexeralfs. They are fine-loamy, oxidic, mesic Vitrandic Palexeralfs that would be in the Jimmerson Series if they were in a mixed, rather than an oxidic, family. These are very deep A-Bt-Cr profile soils with a lithic or a paralithic contact to weathered bedrock below 150 cm depth. They are well drained.

Representative Pedon RC04 - E $\frac{1}{2}$, SE $\frac{1}{4}$, sec. 7, R37N, R3E, Burney Falls Quadrangle.

Classification: fine-loamy, oxidic, mesic Vitrandic Palexeralfs

Altitude: 3320 feet

Slope: convex (linear along contour) E 9% smooth

Surface Stoniness: 10% gravel, cobbles 1%, "stones" < 1%, no boulders

Oi 3-0 cm; loose over weakly matted pine needles and broad leaves.

A 0-8 cm; dark reddish brown (5YR 3/2) loam, reddish brown (5YR 5/3) dry; moderate, fine

- granular;
soft, slightly sticky, nonplastic; common very fine roots; slightly hydrophobic; neutral; clear wavy boundary.
- AB 8-18 cm; dark reddish brown (5YR 3/3) loam; weak, fine and medium subangular blocky; firm, slightly sticky, slightly plastic; common fine and medium roots; slightly acid to neutral; gradual, smooth boundary.
- Bt1 18-48 cm; dark reddish brown (5YR 3/4) clay loam; moderate, fine and medium subangular blocky; very firm, sticky, slightly plastic; discontinuous thin coatings on ped faces; few fine, medium, and coarse roots; slightly acid; diffuse boundary.
- Bt2 48-90 cm; dark reddish brown (2.5YR 4/4) clay loam; moderate, fine and medium subangular blocky; very firm, very sticky, plastic; continuous thin coatings on ped faces; few fine, medium, and coarse roots; moderately acid; diffuse boundary.
- BC 90-110+ cm; reddish brown (5YR 4/4) gravelly clay loam; weak, fine and medium, subangular blocky; very firm, very sticky, plastic; very few fine and medium roots; continuous thin coatings on ped faces; color of Truog pH indicator fades.

Potential Natural Plant Community - Ponderosa pine--black oak. The cover is dense conifer forest, with at least 10% black oak and sparse squawcarpet and greenleaf manzanita. Deerbrush and many herbaceous plants are common in successional stages of this potential natural plant community.

Plants at representative site RC04.

Tree cover, 80%: *Pinus ponderosa*, 50%; *Libocedrus decurrens*, 10%; and *Quercus kelloggii*, 20%. Shrubs cover, 6%: *Arctostaphylos patula*, 2%; *Ceanothus prostratus*, 3%; and *Ceanothus integerrimus*, 1%. Forb cover, 12%: *Polygala cornuta cornuta*, 10%; *Galium bolanderi*, 1%; *Hieracium albiflorum*, 1%; and *Clarkia rhomboidea*, *Eriogonum nudum*, *Calystegia* sp, and *Lathyrus* or *Vicia* sp, each < 1%. Graminoid cover, 6%: *Festuca occidentalis*, 2%; *Elymus elymoides*, 1%; *Carex multicaulis*, 1%; *Achnatherum occidentale*, 1%; *Bromus orcuttianus* < 1%; and *Festuca californica* < 1%. Black oak and incense-cedar seedlings present in understory. A few large Douglas-fir and sugar pine trees are present near site RC04.

ET 322-2 = ET 321-2

ET 322-3 = ET 321-1

330 - PIT RIVER NONFORESTED INNER-GORGE, 60 to 85% slopes

EMU 330 is on very steep slopes of the Pit River inner-gorge. The inner-gorge is characterized by linear slopes that have gradients near the angle of repose for the material on the slopes. That happens to be about 72 to 85% for the volcanic rocks in this EMU. Less steep slopes on talus and finer colluvium at the foot of the long linear slopes are relatively short. Alluvial fans that spread over the edges of terraces and floodplain at the bottom of the inner-gorge are relatively inextensive. The altitude range is 2,400 to 3,400 feet (730 to 1040 m) and the mean annual precipitation is about 50 to 60 inches (125 to 150 cm).

Lithology - middle to late Tertiary andesite and basalt flow rock and andesitic and more silicic breccias and tuff-breccias. These rocks may belong in the western Cascade group (McDonald, 1966) which ranges in age from Eocene to early Pliocene (Hammon, 1979).

Map Unit Composition

- 40% ET 330-1 - andesite inner-gorge : Pachic Haploxerolls : white oak/skunkbrush
- 20% ET 330-2 - andesite inner-gorge : Lithic Xerorthents : birchleaf mountain mahogany/annual grass
- 20% ET 330-3 - andesite inner-gorge : Mollic Haploxeralfs : white oak deerbrush

20% Inclusions: benches and terraces with mixed conifer--black oak; talus with canyon live oak; and colluvial footslopes with mixed conifer (predominantly Douglas-fir, ponderosa pine, and incense-cedar trees) and black oak

ET 330-1

andesite inner-gorge : Pachic Haploxerolls : white oak/skunkbrush

Geomorphology - Mass Wasting/Flow. The landform is inner-gorge sideslopes that are in the Pit River canyon. These slopes are very steep and mostly linear in profile. Debris flow is the predominant geomorphic process.

Soils - Pachic Haploxerolls. They are loamy-skeletal, mixed, thermic Pachic Haploxerolls. These are very deep A-C profile soils in colluvium of volcanic rocks. They are somewhat excessively well drained.

Representative Pedon RC09 - middle, sec. 1, R36N, R2E, Burney Falls Quadrangle.

Classification: loamy-skeletal, mixed, thermic Pachic Haploxerolls

Altitude: 2720 feet

Slope: convex S 72% smooth

Surface Stoniness: 60% gravel, 10% cobbles, 2% "stones", boulders < 1%

Oi 1-0 cm; loose leaves of shrubs, oak trees, and grass.

A1 0-21 cm; very dark grayish brown (10YR 3/2) extremely gravelly loam, dark brown (10YR 4/3) dry; moderate, fine granular; slightly hard, slightly sticky, slightly plastic; common very fine and few fine and medium roots; slightly acid; clear wavy boundary.

A2 21-60 cm; dark brown (10YR 3/3) extremely gravelly loam, brown (10YR 5/3) dry; moderate, very fine subangular blocky; very friable, slightly sticky, slightly plastic; common fine, medium, and coarse roots; neutral; diffuse boundary.

A3 60-90 cm; dark brown (10YR 3/3) extremely gravelly loam, brown (10YR 5/3) dry; weak, very fine subangular blocky; very friable, slightly sticky, slightly plastic; few fine, medium, and coarse roots; neutral; gradual, smooth boundary.

C 90-150+ cm; dark yellowish brown (10YR 3/4) extremely gravelly loam, yellowish brown (10YR 5/4) dry; massive; friable, slightly sticky, slightly plastic; very few fine and medium roots; neutral.

Potential Natural Plant Community - White oak/skunkbrush. The cover is open oak woodland, with at least 20% white oak and 10% skunkbrush. Birchleaf mountain mahogany and other shrubs are generally present, skunkbrush is the dominant one. There is a dense cover of annual grass among the trees and shrubs.

Plants at representative site RC09.

Tree cover, 30%: *Quercus garryana*, 30%. Shrub cover, 30%: *Rhus trilobata*, 25%; *Cercocarpus betuloides*, 3%; *Cercis occidentalis*, 2%; and *Toxicodendron diversilobum* < 1%. Forb cover, 10%; dry annual forbs. Graminoid cover, 60%: dry, unidentified annual grasses, presumably *Vulpia* sp or spp, 40%; *Bromus tectorum*, 20%; *Bromus diandrus* < 1%. Identification of the dried-up annual herbs was not attempted at this site.

ET 330-2

andesite inner-gorge : Lithic Xerorthents : birchleaf mountain mahogany/annual grass

Geomorphology - Fluvial/Eroding Hillslopes. The landform is inner-gorge sideslopes that are in the Pit River canyon. These slopes are very steep and mostly linear in profile. Erosion by overland flow of water is the predominant geomorphic process.

Soils - Lithic Xerorthents. They are loamy-skeletal, mixed, nonacid, thermic Lithic Xerorthents. These are shallow A-Bw-R profile soils on andesite or basalt that range to Lithic Xerochrepts where deeper than 25 cm and to Lithic Haploxerolls where the A horizon is thicker. They are somewhat excessively well drained.

Representative Pedon RC11 - NW¼, NW¼, sec. 6, R36N, R3E, Burney Falls Quadrangle.

Classification: loamy-skeletal, mixed, nonacid, thermic Lithic Xerorthents

Altitude: 2870 feet

Slope: linear SSE 80% rocky

Surface Stoniness: 40% gravel, 15% cobbles, 5% "stones", 2% boulders

Oi 1-0 cm; scattered shrub leaves and grass.

A 0-4 cm; dark brown (7.5YR 3/2) very gravelly loam, brown (7.5YR 5/3) dry; moderate, very fine subangular blocky; slightly hard, slightly sticky, nonplastic; very few very fine roots; slightly acid; abrupt, wavy boundary.

Bw 4-16 cm; dark brown (7.5YR 3/4) very gravelly loam, brown (7.5YR 5/4) dry; moderate, very fine, subangular blocky; slightly hard, slightly sticky, slightly plastic; few very fine and fine roots; slightly acid; abrupt, irregular boundary.

Cr/R 16-25+ hard andesite in slightly hard matrix that is harder within 50 cm depth.

Potential Natural Plant Community - Birchleaf mountain mahogany/annual grass. The cover is discontinuous shrub, sparse white oak trees, and moderately dense annual grass. The shrub cover is mountain mahogany > 10% and no more than 20% skunkbrush, wedgeleaf ceanothus, or any other shrub species. The annual grasses are mainly rattail fescue and soft chess, and cheatgrass where the ground has been eroded or disturbed in other ways.

Plants at representative site RC11.

Tree cover, 6%: *Quercus garryana*, 5%; *Juniperus occidentalis*, 1%. Shrub cover, 50%: *Rhus trilobata*, 20%; *Cercocarpus betuloides*, 20%; *Ceanothus cuneatus*, 6%; *Cercis occidentalis*, 1%; and *Chrysothamnus* sp, 1%. Forb cover, 8%: *Monardella lanceolata*, 5%; Asteraceae, 2%; *Centaurea solstitialis*, 1%. Graminoid cover, 20%: *Vulpia myuros*, 10%; *Bromus hordeaceus*, 5%; *Bromus tectorum*, 5%; *Bromus diandrus* < 1%.

ET 330-3

andesite inner-gorge : Mollic Haploxeralfs : white oak/deerbrush

Geomorphology - Mass Wasting/Flow. The landform is inner-gorge sideslopes that are in the Pit River canyon. These slopes are very steep and mostly linear in profile. Debris flow is the predominant geomorphic process, but slopes have been stable long enough for argillic horizons to develop.

Soils - Mollic Haploxeralfs. They are loamy-skeletal, mixed, mesic Mollic Haploxeralfs. These are very deep A-Bt profile soils in colluvium of volcanic rocks. They are well drained.

Representative Pedon RC10 - E½, NE¼, sec. 1, R36N, R2E, Burney Falls Quadrangle.

Classification: loamy-skeletal, mixed, mesic Mollic Haploxeralfs

Altitude: 2800 feet

Slope: linear E 75% smooth

Surface Stoniness: 10% gravel, 5% cobbles, 2% "stones", boulders < 1%

Oi 2-0 cm; loose leaves of oak trees.

A 0-5 cm; dark brown (7.5YR 3/3) gravelly loam, brown (7.5YR 5/3) dry; strong, fine granular; soft, slightly sticky, slightly plastic; few very fine roots; neutral; clear smooth boundary.

AB 5-30 cm; dark brown (7.5YR 3/4) gravelly loam, brown (7.5YR 5/4) dry; moderate, fine subangular blocky; friable, slightly sticky, slightly plastic; common fine and medium roots; slightly acid; gradual, smooth boundary.

2Bt1 30-70 cm; dark brown (7.5YR 3/4) very gravelly clay loam; moderate, fine subangular blocky;

friable, sticky, plastic; common thin coatings on ped faces; common fine and medium and few coarse roots; moderately acid; diffuse boundary.

2Bt2 90-150+ cm; dark brown (7.5YR 3/4) very gravelly clay loam; moderate, fine subangular blocky; friable, sticky, plastic; discontinuous thin coatings on ped faces; common fine, medium, and coarse roots; moderately acid.

Potential Natural Plant Community - White oak/deerbrush. The cover is dense white oak woodland, with at least 2% deerbrush. Although other shrub species are generally present and one or more may be more prevalent than deerbrush, deerbrush is the indicator of this plant association. Deerbrush is commonly an indicator of timber sites, but there conifers are sparse in this plant association. There is a dense cover of annual grass among the trees and shrubs.

Plants at representative site RC10.

Tree cover, 80%: *Quercus garryana*, 80%; *Pinus ponderosa*, 1%; *Quercus chrysolepis*, 1%. Shrub cover, 15%: *Rhus trilobata*, 5%; *Ceanothus integerrimus*, 5%; *Amelanchier utahensis*, 2%; *Cercocarpus betuloides*, 2%; *Lonicera interrupta*, 1%; and *Toxicodendron diversilobum*, 1%. Forb cover, 3%; *Galium bolanderi*, 1%; *Epilobium brachycarpum*, 1%; and *Clarkia rhomboidea* and *Erigeron* sp, each < 1%. Graminoid cover, 8%: *Bromus tectorum*, 5%; *Bromus diandrus*, 1%; and *Elymus glaucus*, 2%. White oak seedlings are common in the understory.

331 - JAKE SPRING MOUNTAIN SIDESLOPE, 25 to 60% slopes

EMU 331 is on steep mountain sideslopes above the inner-gorge of the Pit River and, on the north side of the River, above the Delucci hillocks. The altitude range is 3,040 to 4,040 feet (930 to 1230 m), and the mean annual precipitation is 50 to 60 inches (125 to 150 cm).

Lithology - andesite or basalt. These are late Tertiary basalt and andesite flows and possibly some andesitic to silicic breccias and tuff-breccias.

Map Unit Composition

70% andesite or basalt mountain sideslopes : Vitrandic Haploxeralfs : mixed conifer-black oak

20% andesite or basalt mountain sideslopes : Vitrandic Palexeralfs : mixed conifer-black oak

10% Inclusions: rock outcrop; and shallow soils with conifers, black oak, and shrubs

ET 331-1

andesite or basalt mountain sideslopes : Vitrandic Haploxeralfs : mixed conifer--black oak

Geomorphology - Undifferentiated Hill (Mountain) Slopes. The landform is steep mountain sideslopes. Mass wasting by flow, fluvial erosion by overland flow of water, and chemical erosion by weathering and leaching are all important geomorphic processes in this ET.

Soils - Vitrandic Haploxeralfs. They are loamy-skeletal, oxidic, mesic Vitrandic Haploxeralfs. These are very deep A-Bt-R or A-Bt-Cr profile soils with a lithic or a paralithic contact to weathered bedrock at 60 to 150 cm depth. They are well drained.

Representative Pedon RC25 - NE¼, NE¼, sec. 14, R36N, R2E, Burney Quadrangle.

Classification: loamy-skeletal, oxidic, mesic Vitrandic Haploxeralfs

Altitude: 3620 feet

Slope: linear (linear along contour, also) W 40% smooth

Surface Stoniness: 15% gravel, 3% cobbles, "stones" < 1%, no boulders

Oi 4-0 cm; loose over weakly matted conifer needles and oak leaves.

- A1 0-3 cm; dark reddish brown (5YR 3/3) gravelly sandy loam, brown (7.5YR 5/3) dry; moderate, very fine granular; soft, slightly sticky, nonplastic; few very fine roots; moderately hydrophobic; slightly acid; abrupt, wavy boundary.
- A2 3-24 cm; dark reddish brown (5YR 3/4) gravelly sandy loam, reddish brown (5YR 5/5) dry; moderate, very fine subangular blocky; friable, slightly sticky, nonplastic; common fine and medium roots; slightly hydrophobic; moderately to slightly acid; gradual, smooth boundary.
- AB 24-42 cm; reddish brown (5YR 4/4) very gravelly loam, light reddish brown (5YR 6/4) dry; moderate, very fine subangular blocky; friable, slightly sticky, nonplastic; common fine, medium, and coarse roots; nonhydrophobic; moderately acid; gradual, smooth boundary.
- Bt1 42-75 cm; reddish brown (5YR 4/4) very gravelly loam, light reddish brown (5YR 6/5) dry; moderate fine and medium subangular blocky; firm, slightly sticky, slightly plastic; few thin coatings on ped faces; few fine, medium, and coarse roots; moderately acid; diffuse boundary.
- Bt2 75-105 cm; reddish brown (5YR 4/4) very gravelly clay loam, light reddish brown (5YR 6/5) dry; weak, medium subangular blocky; firm, sticky, slightly plastic; common thin coatings on ped faces; very few fine and medium roots; moderately acid; abrupt, irregular boundary.
- R 105+ cm; hard, fractured andesite or basalt.

Note: Some stones weathered soft in B horizon, others still hard but with soft weathering rinds.

Potential Natural Plant Community - Mixed conifer--black oak.

The cover is dense conifer forest, with at least 10% black oak. Shrubs and herbaceous plants are scarce, although deerbrush and many herbaceous plants are common in successional stages of this potential natural plant community.

Plants at representative site RC25.

Tree cover, 80%: *Pseudotsuga menziesii*, 40%; *Pinus ponderosa*, 1%; *Pinus lambertiana* < 1%; *Libocedrus decurrens*, 3%; and *Quercus kelloggii*, 20%. Shrub cover, 10%: *Chamaebatia foliolosa*, 10%. Forb cover, 6%: *Trientalis latifolia*, 3%; *Polygala cornuta*, 2%; *Galium bolanderi*, 1%; and *Clarkia rhomboidea* < 1%. Graminoid cover, 5%: *Festuca californica*, 5%; *Bromus orcuttianus* < 1%; and *Carex multicaulis* < 1%. Douglas-fir, ponderosa pine, sugar pine, incense-cedar, and black oak seedlings present in understory.

ET 331-2

andesite or basalt plateau : Vitrandic Palexeralfs : mixed conifer--black oak

Geomorphology - Fluvial-Eroding Hill (Mountain) Slopes. The landform is moderately steep to marginally steep mountain ridgetops, benches, and sideslopes. Fluvial erosion by overland flow of water is the predominant geomorphic process. It may be effective, however, only after a catastrophic event, such as a forest fire, that leads to the loss of forest litter covering the soils. Chemical denudation by weathering and leaching is also an important geomorphic processes in this ET.

Soils - Vitrandic Palexeralfs. They are fine-loamy, oxidic, mesic Vitrandic Palexeralfs that would be in the Jimmerson Series if they were in a mixed, rather than an oxidic, family. These are very deep A-Bt-Cr profile soils with a paralithic contact to weathered bedrock below 150 cm depth. They are well drained.

Pedon at site RC06 in ET 332-1 is representative of these soils.

Potential Natural Plant Community - Mixed conifer--black oak. The cover is dense conifer forest, with at least 10% black oak. Shrubs and herbaceous plants are scarce, although deerbrush and many herbaceous plants are common in successional stages of this potential natural plant community.

Vegetation at site RC06 in ET 332-1 is representative of this plant community.

332 - JAKE SPRING PLATEAU, 6 to 30% slopes

EMU 332 is on broad mountain ridges and the lowest of a series of broad benches or plateaus above the Delucci hillocks, north of the Pit River. It occurs at comparable altitudes south of the Pit River. The altitude range is 3,280 to 4,000 feet (1000 to 1200 m), and the mean annual precipitation is 50 to 60 inches (125 to 150 cm).

Lithology - andesite or basalt. These are late Tertiary basalt and andesite flows and possibly some andesitic to silicic breccias and tuff-breccias.

Map Unit Composition

- 80% andesite or basalt plateau : Vitrandic Palexeralfs : mixed conifer--black oak
- 15% andesite or mountain sideslopes : Vitrandic Haploxeralfs : mixed conifer--black oak
- 5% Inclusions: rock outcrop; and shallow soils with conifers, black oak, and shrubs

ET 332-1

andesite or basalt plateau : Vitrandic Palexeralfs : mixed conifer--black oak

Geomorphology - Fluvial/Eroding Hill (Mountain) Slopes. The landform is a gently sloping to moderately steep mountain ridgetops, benches, plateaus, and sideslopes. Fluvial erosion by overland flow of water is the predominant geomorphic process. It may be effective, however, only after a catastrophic event, such as a forest fire, that leads to the loss of forest litter covering the soils. Chemical denudation by weathering and leaching is also an important geomorphic processes in this ET.

Soils - Vitrandic Palexeralfs. They are fine-loamy, oxidic, mesic Vitrandic Palexeralfs that would be in the Jimmerson Series if they were in a mixed, rather than an oxidic, family. These are very deep A-Bt-Cr profile soils with a paralithic contact to weathered bedrock below 150 cm depth. They are well drained.

Representative Pedon RC06 - NW¹/₄, NE¹/₄, sec. 26, R37N, R2E, Burney Falls Quadrangle.

Classification: fine-loamy, oxidic, mesic Vitrandic Palexeralfs

Altitude: 3580 feet

Slope: linear (convex along contour) ESE 27% smooth

Surface Stoniness: 20% gravel, cobbles < 1%, no "stones", no boulders

Oi 3-0 cm; loose over weakly matted pine and Douglas-fir needles.

A 0-9 cm; dark reddish brown (5YR 3/3) gravelly loam, brown (7.5YR 5/3) dry; moderate, fine granular; slightly hard, slightly sticky, nonplastic; few very fine, fine, and medium roots; slightly hydrophobic; moderately acid; clear wavy boundary.

AB 9-27 cm; dark reddish brown (5YR 3/4) loam; weak, fine granular; friable, slightly sticky, slightly plastic; common fine, medium, and coarse roots; strongly acid; gradual, smooth boundary.

Bt1 27-54 cm; dark reddish brown (5YR 3/4) clay loam; moderate, fine subangular blocky; firm, sticky, plastic; continuous thin coatings on ped faces; few fine, medium, and coarse roots; moderately acid; diffuse boundary.

Bt2 54-90 cm; dark reddish brown (5YR 3/4) clay loam, with few fine black mottles; moderate, very fine subangular blocky; very firm, sticky, plastic; continuous thin coatings on ped faces; very few fine and medium roots; slightly acid; gradual, wavy boundary.

BC 90-150+ cm; reddish brown (5YR 4/4) gravelly clay loam; massive; extremely firm, very sticky, plastic; very few fine and medium roots; moderately acid.

Note: Some stones weathered soft in B horizon, others still hard but with soft weathering rinds.

Potential Natural Plant Community - Mixed conifer--black oak. The cover is dense conifer forest, with at least 10% black oak. Shrubs and herbaceous plants are scarce, although deerbrush and many herbaceous plants are common in successional stages of this potential natural plant community.

Plants at representative site RC06.

Tree cover, 95%: *Pseudotsuga menziesii*, 40%; *Pinus ponderosa*, 20%; *Pinus lambertiana*, 10%; *Libocedrus decurrens*, 10%; and *Quercus kelloggii*, 15%. No shrubs. Herb cover, 1%; *Polygala cornuta*, *Carex rossii*, and *Carex multicaulis*, each < 1%. Black oak, Douglas-fir, ponderosa pine, and incense-cedar seedlings present in understory.

ET 332-2

andesite or basalt mountain sideslopes : Vitrandic Haploxeralfs : mixed conifer--black oak

Geomorphology - Fluvial-Eroding Hill (Mountain) Slopes. The landform is moderately steep ridgetops and mountain sideslopes. Fluvial erosion by overland flow of water is the predominant geomorphic processes in this ET, although chemical denudation by weathering and leaching is important, too.

Soils - Vitrandic Haploxeralfs. They are loamy-skeletal, oxidic, mesic Vitrandic Haploxeralfs. These are moderately deep to deep A-Bt-R or A-Bt-Cr profile soils with a lithic or a paralithic contact to weathered bedrock at 60 to 150 cm depth. They are well drained.

Pedon at site RC25 in ET 331-1 is representative of these soils.

Potential Natural Plant Community - Mixed conifer--black oak. The cover is dense conifer forest, with at least 10% black oak. Shrubs and herbaceous plants are scarce, although deerbrush and many herbaceous plants are common in successional stages of this potential natural plant community.

Vegetation at site RC25 in ET 331-1 is representative of this plant community.

333 SUMMIT LAKE MOUNTAIN SIDESLOPES, 25 to 60% slopes

EMU 333 is on steep mountain sideslopes above or on the north side of ridges, benches or plateaus of the Jake Spring Plateau EMU. The altitude range is 3,320 to 5,040 feet (1010 to 1540 m), and the mean annual precipitation is 55 to 65 inches (140 to 165 cm).

Lithology - andesite or basalt. These are late Tertiary basalt and andesite flows and possibly some andesitic to silicic breccias and tuff-breccias.

Map Unit Composition

- 40% andesite or basalt mountain sideslopes : Humic Haploxerands : white fir--black oak
- 40% andesite or basalt mountain sideslopes : Andic Haplohumults : white fir--black oak
- 20% Inclusions: rock outcrop; shallow soils with conifers, black oak, and shrubs on steep

slopes; and very deep Andic Palehumults with white fir and black oak on moderately steep slopes

ET 333-1

andesite or basalt mountain sideslopes : Humic Haploxerands : white fir--black oak

Geomorphology - Undifferentiated Hill (Mountain) Slopes. The landform is steep mountain sideslopes. Mass wasting by flow, fluvial erosion by overland flow of water, and chemical erosion by weathering and leaching are all important geomorphic processes in this ET.

Soils - Humic Haploxerands. They are medial-skeletal, mesic Humic Haploxerands that are similar to the Depner Series of Typic Haploxerands. These are moderately deep to deep A-Bw-Cr profile soils with a lithic or a paralithic contact to weathered bedrock at 50 to 150 cm depth. They are well drained.

Representative Pedon RC20 - W½, sec. 8, R37N, R2E, Burney Falls Quadrangle.

Classification: medial-skeletal, mesic Humic Haploxerands

Altitude: 4760 feet

Slope: linear (linear along contour, also) SSE 60% smooth

Surface Stoniness: 20% gravel, 10% cobbles, 5% "stones", 2% boulders

Oi 6-2 cm; loose over matted conifer needles and oak leaves.

Oe 2-0 cm; fragmented, weathered, conifer needles and humus.

A 0-5 cm; very dark brown (7.5YR 2/2) gravelly sandy loam, dark brown (7.5YR 4/3) dry; strong, very fine granular; soft, slightly sticky, nonplastic; common very fine and few fine roots; very highly hydrophobic; neutral; clear, wavy boundary.

AB 5-21 cm; dark brown (7.5YR 3/2) very gravelly sandy loam, brown (7.5YR 5/3) dry; moderate, very fine, subangular blocky; very friable; slightly sticky, nonplastic; common fine, medium, and coarse roots; highly hydrophobic; slightly acid; gradual, smooth boundary.

Bw 21-65 cm; dark brown (7.5YR 3/3) very gravelly sandy loam, brown (7.5YR 5/4) dry; weak, fine, subangular blocky; very friable; slightly sticky, nonplastic; common fine, medium, and coarse roots; slightly hydrophobic; moderately acid; gradual, smooth boundary.

BC 65-90 cm; dark brown (7.5YR 3/4) extremely gravelly sandy loam, brown (7.5YR 5/5) dry; massive; very friable; slightly sticky, nonplastic; few fine and medium roots; strongly acid; abrupt, irregular boundary.

Cr 90-100+ cm; andesite or basalt weathered soft; fractures > 30 cm apart.

Potential Natural Plant Community - White fir--black oak. The cover is dense conifer forest, with at least 15% white fir and 5% black oak. White fir is a dominant or codominant conifer and there are white fir seedlings in the understory. Shrubs and herbaceous plants are scarce, although shrubs and many herbaceous plants are common in successional stages of this potential natural plant community.

Plants at representative site RC20.

Tree cover, 90%: *Abies concolor*, 15%; *Pseudotsuga menziesii*, 15%; *Pinus ponderosa*, 15%; *Pinus lambertiana* 15%; *Libocedrus decurrens*, 15%; *Quercus kelloggii*, 10%; and *Cornus nuttallii*, 5%. Shrub cover, < 1%:

Amelanchier utahensis and *Symphoricarpos mollis*. Forb cover, 5%: *Campanula prenanthoides*, 1%; and *Galium*

bolanderi, *Epilobium brachycarpum*, *Apocynum androsaemifolium*, *Clarkia rhomboidea*, *Hieracium albiflorum*,

Phacelia sp, and *Penstemon* sp, each < 1%. Graminoid cover, 2%: *Carex rossii*, 2%; *Bromus orcuttianus* < 1%; and

Melic aristata < 1%. Five mixed conifer species are about equally abundant, and all have seedlings in the

understory. White fir trees are more dominant on north and east-facing slopes than on this site that is transitional to mixed conifer--black oak.

ET 333-2

andesite or basalt mountain sideslopes : Andic Haplohumults : white fir--black oak

Geomorphology - Undifferentiated Hill (Mountain) Slopes. The landform is steep mountain sideslopes. Mass wasting by flow, fluvial erosion by overland flow of water, and chemical erosion by weathering and leaching are all important geomorphic processes in this ET.

Soils - Andic Haplohumults. They are loamy-skeletal, mixed, mesic Andic Haplohumults and Palehumults. These are moderately deep to very deep A-Bt-Cr profile soils with a paralithic contact to weathered bedrock at 60 to > 150 cm depth. The only difference between the Haplohumults and Palehumults is depth to bedrock. Apparently, the Palehumults, which are deeper than 150 cm, are in colluvium. They are well drained.

Representative Pedon RC23 - middle, sec. 31, R37N, R2E, Skunk Ridge Quadrangle.

Classification: loamy-skeletal, mixed, mesic Andic Palehumult

Altitude: 4360 feet

Slope: linear (linear along contour, also) ENE 42% smooth

Surface Stoniness: 5% gravel, 1% cobbles, "stones" < 1%, boulders < 1%

Oi 5-0 cm; loose over weakly matted conifer needles

A1 0-7 cm; very dark brown (7.5YR 2/2) sandy loam, dark brown (7.5YR 4/2) dry; strong, very fine granular; soft, slightly sticky, nonplastic; few very fine roots; highly hydrophobic; moderately acid; clear, smooth boundary.

A2 7-22 cm; very dark brown (7.5YR 2/3) gravelly sandy loam, dark brown (7.5YR 4/3) dry; moderate, very fine, subangular blocky parts to very fine granular; soft, very friable, slightly sticky, nonplastic; common very fine, fine, medium, and coarse roots; highly hydrophobic; slightly acid; clear, wavy boundary.

AB 22-58 cm; dark brown (7.5YR 3/4) gravelly sandy loam, brown (7.5YR 5/4) dry; moderate, fine, subangular blocky; friable; slightly sticky, nonplastic; common fine, medium, and coarse roots; slightly hydrophobic; moderately acid; gradual, smooth boundary.

Bt1 58-115 cm; dark brown (7.5YR 3/4) very gravelly clay loam, brown (7.5YR 5/4) dry; weak, medium, subangular blocky; firm; sticky, plastic; discontinuous coatings on ped faces; few fine, medium, and coarse roots; strongly acid; diffuse boundary.

Bt2 115-155+ cm; dark brown (7.5YR 3/4) very gravelly clay loam; massive; firm; sticky, plastic; very few fine and medium roots; very strongly acid.

Note: stones hard in A horizon, hardness decreasing with depth, stones slightly hard in B horizon.

Potential Natural Plant Community - White fir--black oak. The cover is dense conifer forest, with at least 15% white fir and 5% black oak. White fir is a dominant or codominant conifer and there are white fir seedlings in the understory. Shrubs and herbaceous plants are scarce, although shrubs and many herbaceous plants are common in successional stages of this potential natural plant community.

Plants at representative site RC23.

Tree cover, 90%: *Abies concolor*, 60%; *Pseudotsuga menziesii*, 5%; *Pinus ponderosa*, 5%; *Pinus lambertiana* 5%; *Libocedrus decurrens*, 10%; *Quercus kelloggii*, 5%; and *Cornus nuttallii*, 10%. Shrub cover, 5%: *Pachistima myrsinites*, 2%; *Rosa gymnocarpa*, 2%; and *Ribes* sp, 1%. Forb cover, 3%: *Chimaphila umbellata*, 1%; *Pyrola picta*, 1%; *Asarum* sp, 1%; and *Chimaphila menziesii*, *Trientalis latifolia*, and *Galium* sp, each < 1%. Graminoid cover, < 1%: *Bromus orcuttianus*. Ferns, < 1%: *Pteridium aquilinum* < 1%. White fir, incense-cedar, and dogwood seedlings are common in the understory.

334 SUMMIT LAKE PLATEAU, 6 to 30% slopes

EMU 334 is on broad ridges, benches, and plateau above the ridges, benches, and plateau of the Jake Spring Plateau EMU. The altitude range is 3,560 to 5,060 feet (1085 to 1540 m), and the mean annual precipitation is 55 to 65 inches (140 to 165 cm).

Lithology - andesite or basalt. These are late Tertiary basalt and andesite flows and possibly some andesitic to silicic breccias and tuff-breccias.

Map Unit Composition

- 70% andesite or basalt plateau : Andic Palehumults : white fir--black oak
- 20% andesite or basalt mountain sideslopes : Andic Haplohumults : white fir--black oak
- 10% Inclusions: rock outcrop; shallow soils with conifers, black oak, and shrubs on steep slopes; and Ultic Haploxerands with white fir and black oak on moderately steep slopes

ET 334-1

andesite or basalt plateau : Andic Palehumults : white fir--black oak

Geomorphology - Eroding Hill (Mountain) Slopes. The landforms are gently sloping broad ridges and benches. The benches are old flow surfaces bounded by steep slopes on both upper and lower edges. Fluvial erosion by overland flow of water, and chemical erosion by weathering and leaching are the most important geomorphic processes in this ET.

Soils - Andic Palehumults. They are fine-loamy, oxidic, mesic Andic Palehumults that grade to Andic Palexeralfs (Wyntoon taxajunct) at lower altitude. These are very deep A-Bt-Cr profile soils with a paralithic contact to weathered bedrock below 150 cm depth. They are well drained.

Representative Pedon RC08 - W½, W½, sec. 28, R37N, R2E, Burney Falls Quadrangle.

Classification: fine-loamy, oxidic, mesic Andic Palehumult

Altitude: 4580 feet

Slope: convex (convex along contour, also) WSW 26% smooth

Surface Stoniness: 10% gravel, 2% cobbles, 2% "stones", 1% boulders

Oi 4-1 cm; loose over weakly matted conifer needles

Oe 1-0 cm; weathered and blackened fragments of conifer needles, and humus

A1 0-9 cm; dark reddish brown (5YR 3/2) sandy loam, reddish brown (5YR 5/3) dry; strong, very fine granular; soft, very friable, slightly sticky, nonplastic; common very fine roots; highly hydrophobic; moderately acid; clear, wavy boundary.

A2 9-21 cm; dark reddish brown (5YR 3/3) sandy loam; strong, very fine, granular; very friable, slightly sticky, nonplastic; common fine, medium, and coarse roots; highly hydrophobic; slightly acid; gradual, smooth boundary.

AB 21-42 cm; dark reddish brown (5YR 3/4) gravelly loam; weak, very fine, subangular blocky parts to moderate, very fine granular; very friable; slightly sticky, nonplastic; common fine, medium, and coarse roots; moderately hydrophobic; moderately acid; pH 9.5 in NaF; clear, smooth boundary.

Bt1 42-66 cm; reddish brown (2.5-5YR 4/4) gravelly loam; moderate, fine, subangular blocky; firm; sticky, slightly plastic; common, thin coatings on ped faces; few fine and medium roots; strongly acid; gradual, smooth boundary.

Bt2 66-98 cm; reddish brown (5YR 4/4) clay loam; weak, medium, subangular blocky; firm; sticky, plastic; discontinuous, thin coatings on ped faces and continuous, moderately thick coatings in tubular pores; very few fine and medium roots; very strongly acid; diffuse boundary.

BCt 98-150 cm; reddish brown (5-7.5YR 4/4) gravelly clay loam; weak, coarse, subangular blocky; friable; sticky, plastic; continuous, thin coatings on ped faces; very few fine and medium roots; extremely acid; abrupt, irregular boundary.

Cr 150-160+ cm; andesite or basalt weathered soft; continuous black stains on fractures.

Note: stones hard above 66 cm, weathered soft below 66 cm depth.

Potential Natural Plant Community - White fir--black oak. The cover is dense conifer forest, with at least 15% white fir and 5% black oak. White fir is a dominant or codominant conifer and there are white fir seedlings in the understory. Shrubs and herbaceous plants are scarce, although shrubs and many herbaceous plants are common in successional stages of this potential natural plant community.

Plants at representative site RC08.

Tree cover, 90%: *Abies concolor*, 25%; *Pseudotsuga menziesii*, 25%; *Pinus ponderosa*, 5%; *Pinus lambertiana* 10%; *Libocedrus decurrens*, 10%; and *Quercus kelloggii*, 15%. Shrub cover, 3%: *Rosa gymnocarpa*, 2%; *Ribes* sp., 1%; and *Symphoricarpos mollis*, *Amelanchier utahensis*, *Pachistima myrsinites*, and *Prunus emarginata*, each < 1%. Forb cover, 1%: *Chimaphila umbellata*, *Pyrola picta*, *Asarum* sp., *Campanula prenanthoides*, *Galium bolanderi*, *Polygala cornuta*, and *Smilacena* sp., each < 1%. Graminoid cover, 1%: *Carex rossii*, 1%; and *Festuca californica*, *Bromus ciliatus*, and *Achnatherum* sp., each < 1%. White fir, incense-cedar, Douglas-fir, sugar pine, ponderosa pine, and black oak seedlings are common in the understory. Mountain whitethorn is abundant on skid trails near site RC23.

ET 334-2

andesite or basalt mountain sideslopes : Andic Haplohumults : white fir--black oak

Geomorphology - Fluvial- Eroding Hill (Mountain) Slopes. The landform is steep mountain sideslopes. Fluvial erosion by overland flow of water is the dominant geomorphic process in this ET, although chemical erosion by weathering and leaching is an important geomorphic processes, too.

Soils - Andic Haplohumults. They are loamy-skeletal, mixed, mesic Andic Haplohumults and Palehumults. These are moderately deep to very deep A-Bt-Cr profile soils with a paralithic contact to weathered bedrock at 60 to > 150 cm depth. The only difference between the Haplohumults and Palehumults is depth to bedrock. Apparently, the Palehumults, which are deeper than 150 cm, are in colluvium. They are well drained.

Pedon at site RC23 in ET 333-2 is representative of these soils.

Potential Natural Plant Community - White fir--black oak. The cover is dense conifer forest, with at least 15% white fir and 5% black oak. White fir is a dominant or codominant conifer and there are white fir seedlings in the understory. Shrubs and herbaceous plants are scarce, although shrubs and many herbaceous plants are common in successional stages of this potential natural plant community.

Vegetation at site RC23 in ET 333-2 is representative of this plant community.

335 SQUAW FLAT MOUNTAIN SIDESLOPE, 25 to 60% slopes

EMU 335 is on steep mountain sideslopes above or on the north side of ridges, benches or plateaus of the Summit Lake Plateau EMU. The altitude range is 3,920 to 5,280 feet (1190 to 1610 m), and the mean annual precipitation is 60 to 70 inches (150 to 180 cm).

Lithology - andesite or basalt. These are late Tertiary basalt and andesite flows and possibly some andesitic to silicic breccias and tuff-breccias.

Map Unit Composition

- 70% andesite or basalt mountain sideslopes : Humic Haploxerands : white fir/vine maple
- 20% andesite or basalt mountain sideslopes : Humic Haploxerands : white fir/bush chinquapin
- 10% Inclusions: rock outcrop; shallow soils with conifers and shrubs on steep slopes; and deep to very deep Ultic Haploxerands with white fir on moderately steep slopes

ET 335-1

andesite or basalt mountain sideslopes : Humic Haploxerands : white fir/vine maple

Geomorphology - Undifferentiated Hill (Mountain) Slopes. The landform is steep mountain sideslopes. Mass wasting by flow, fluvial erosion by overland flow of water, and chemical erosion by weathering and leaching are all important geomorphic processes in this ET.

Soils - Humic Haploxerands. They are medial-skeletal, frigid Humic Haploxerands. These are very deep A-Bw-Cr profile soils with a lithic or a paralithic contact to weathered bedrock at 50 to > 150 cm depth. They are well drained.

Representative Pedon RC01 - SE¼, sec. 18, R37N, R2E, Skunk Ridge Quadrangle.

Classification: medial-skeletal, frigid Humic Haploxerand

Altitude: 4880 feet

Slope: linear (linear along contour, also) WNW 45% smooth

Surface Stoniness: 5% gravel, 1% cobbles, 1% "stones", 1% boulders

Oi 5-0 cm; matted fir and pine needles (L-layer, 3 cm) over weathered leaf fragments (F-layer, 2 cm).

A1 0-4 cm; very dark brown (7.5YR 2/2) loam, dark brown (7.5YR 3/3) dry; strong, very fine granular; soft, slightly sticky, nonplastic; few very fine roots; very highly hydrophobic; strongly acid; abrupt, smooth boundary.

A2 4-16 cm; very dark brown (7.5YR 2/2) loam; strong, very fine granular; very friable, slightly sticky, nonplastic; common very fine and fine roots; highly hydrophobic; moderately acid; gradual, smooth boundary.

AB 16-48 cm; dark brown (7.5YR 3/2) gravelly loam; strong, very fine granular; very friable; slightly sticky, nonplastic; many fine, medium, and coarse roots; moderately hydrophobic; strongly to moderately acid; gradual, smooth boundary.

Bw 48-72 cm; dark brown (7.5YR 3/4) very gravelly loam; strong, very fine granular; very friable; slightly sticky, nonplastic; common fine, medium, and coarse roots; slightly hydrophobic; strongly acid; clear, wavy boundary.

Cr 72-110+ cm; highly fractured (cracks 5 to 10 cm apart) andesite or basalt weathered soft.

Potential Natural Plant Community - White fir/vine maple. The cover is dense conifer forest, with at least 15% white fir and no more than 5% black oak. White fir is a dominant or codominant conifer and there are white fir seedlings in the understory. Vine maple is generally present and more abundant than bush chinquapin. Herbaceous plants are scarce, although shrubs and many herbaceous plants are common in successional stages of this potential natural plant community.

Plants at representative site RC01.

Tree cover, 80%: *Abies concolor*, 60%; *Pseudotsuga menziesii*, 15%; *Pinus lambertiana* 5%; *Quercus kelloggii*, 5%; *Populus tremuloides*, 1%; and *Cornus nuttallii*, 2%. Shrub cover, 15%: *Chrysolepis sempervirens*, 3%; *Acer circinatum*, 10%; *Salix scouleriana*, 2%; *Amelanchier utahensis*, 1%; and *Symphoricarpos mollis*, *Ceanothus velutinus*, *Pachistima myrsinites*, *Rosa gymnocarpa*, *Rubus parviflorus*, and *Ribes* sp, each < 1%. Forb cover, 5%: *Chimaphila menziesii*, 2; *Pyrola picta*, 2%; *Galium aparine*, 1%; and *Veratrum californicum*, *Phacelia* sp, and *Lilium* sp, each < 1%. Graminoid cover, 2%: *Carex rossii*, 2%; *Festuca californica* < 1%; and *Melic aristata* < 1%. Ferns, 1%: *Pteridium aquilinum*. White fir seedlings are common in understory. This is a moist site, but not a wet one, even though corn lily is present.

ET 335-2

andesite or basalt plateau : Humic Haploxerands : white fir/bush chinquapin

Geomorphology - Eroding Hill (Mountain) Slopes. The landform is moderately steep broad mountain ridges, benches, and sideslopes. Fluvial erosion by overland flow of water and chemical erosion by weathering and leaching are important geomorphic processes in this ET. Fluvial erosion is dependent on burning, or other disturbance, to remove the cover of forest litter.

Soils - Humic Haploxerands. They are medial, frigid Humic Haploxerands. These are very deep A-Bw-Cr profile soils with a lithic or a paralithic contact to weathered bedrock at 60 to > 150 cm depth. They are well drained.

Pedon at site RC03 in ET 336-1 is representative of these soils.

Potential Natural Plant Community - White fir/bush chinquapin. The cover is dense conifer forest, with at least 15% white fir and no more than 5% black oak. White fir is a dominant or codominant conifer and there are white fir seedlings in the understory. Bush chinquapin is generally present and more abundant than vine maple. Herbaceous plants are scarce, although shrubs and many herbaceous plants are common in successional stages of this potential natural plant community.

Vegetation at site RC03 is representative of this plant community.

336 SQUAW FLAT PLATEAU, 6 to 30% slopes

EMU 336 is on broad ridges, benches, and plateau above the ridges, benches, and plateau of the Summit Lake Plateau EMU. The altitude range is 4,920 to 5,360 feet (1500 to 1630 m), and the mean annual precipitation is 60 to 70 inches (150 to 180 cm).

Lithology - andesite or basalt. These are late Tertiary basalt and andesite flows and possibly some andesitic to silicic breccias and tuff-breccias.

Map Unit Composition

- 40% andesite or basalt plateau : Humic Haploxerands : white fir/bush chinquapin
- 40% andesite or basalt plateau : Ultic Haploxerands : white fir/bush chinquapin
- 15% andesite or basalt mountain sideslopes : Humic Haploxerands : white fir/vine maple
- 5% Inclusions: rock outcrop; shallow soils with white fir and shrubs on moderately steep slopes; and riparian areas along drainage ways

ET 336-1

andesite or basalt plateau : Humic Haploxerands : white fir/bush chinquapin

Geomorphology - Eroding Hill (Mountain) Slopes. The landform is gently sloping to moderately steep broad mountain ridges and small plateaus. Fluvial erosion by overland flow of water and chemical erosion by weathering and leaching are important geomorphic processes in this ET. Fluvial erosion is dependent on burning, or other disturbance, to remove the cover of forest litter.

Soils - Humic Haploxerands. They are medial and medial over loamy-skeletal (Revit Series), frigid Humic Haploxerands. These are very deep A-Bw-Cr profile soils with a lithic or a paralithic contact to weathered bedrock at 60 to > 150 cm depth. They are well drained.

Representative Pedon RC03 - NW¼, sec. 18, R37N, R2E, Skunk Ridge Quadrangle.

Classification: medial, frigid Humic Haploxerand

Altitude: 5100 feet

Slope: linear (convex along contour) S 8% smooth

Surface Stoniness: 5% gravel, cobbles < 1%, 1% "stones", 2% boulders

- Oi 10-5 cm; matted fir needles.
- Oe 5-0 cm; weathered conifer needle fragments and humus; few very fine roots..
- A 0-15 cm; very dark brown (7.5YR 2/2) loam, dark brown (7.5YR 3/3) dry; strong, very fine granular; very friable; slightly sticky, nonplastic; common very fine, fine, and medium roots; highly hydrophobic; strongly acid; gradual, smooth boundary.
- AB 15-38 cm; dark reddish brown (5YR 2/3) loam, reddish brown (5YR 4/3) dry; weak, very fine and fine, subangular blocky; very friable; slightly sticky, nonplastic; common fine, medium, and coarse roots; moderately hydrophobic; very strongly to strongly acid; clear, smooth boundary.
- Bw 38-58 cm; dark reddish brown (5YR 3/3) gravelly loam, reddish brown (5YR 4/4) dry; weak, fine, subangular blocky; friable; slightly sticky, nonplastic; few fine, medium, and coarse roots; slightly hydrophobic; very strongly acid; gradual, smooth boundary.
- BC 58-72 cm; dark reddish brown (2.5YR 3/4) very gravelly loam, reddish brown (5YR 5/4) dry; massive; friable; slightly sticky, nonplastic; very few fine and medium roots; slightly hydrophobic; extremely acid; abrupt, irregular boundary.
- Cr 72-80+ cm; andesite or basalt weathered soft.

Potential Natural Plant Community - White fir/bush chinquapin. The cover is dense conifer forest, with at least 15% white fir and no more than 5% black oak. White fir is a dominant or codominant conifer and there are white fir seedlings in the understory. Bush chinquapin is generally present and more abundant than vine maple. Herbaceous plants are scarce, although shrubs and many herbaceous plants are common in successional stages of this potential natural plant community.

Plants at representative site RC03.

Tree cover, 75%: *Abies concolor*, 70%; *Pinus lambertiana* 5%; and *Populus tremuloides*, 2%. Shrub cover, 35%: *Chrysolepis sempervirens*, 30%; *Acer circinatum*, 3%; *Salix scouleriana*, 2%; *Amelanchier utahensis*, 2%; *Quercus kelloggii*, 1%; *Rubus parviflorus* < 1%; and *Ribes* sp < 1%. Forb cover, 2%: *Chimaphila menziesii*, 1; and *Pyrola picta*, 1%. Ferns, 5%: *Pteridium aquilinum*. White fir seedlings are present in understory. Black oak is a shrub at this site; it is not expected to become a tree. Spreading dogbane and sedge are present in disturbed areas near site RC03.

ET 336-2

andesite or basalt plateau : Ultic Haploxerands : white fir/bush chinquapin

Geomorphology - Fluvial-Eroding Hill (Mountain) Slopes. The landforms are gently sloping broad ridges and benches. The benches are old flow surfaces bounded by steep slopes on both upper and lower edges. Fluvial erosion by overland flow of water, and chemical erosion by weathering and leaching are the most important geomorphic processes in this ET.

Soils - Ultic Haploxerands. They are medial over fine-loamy, frigid Ultic Haploxerands. These are deep to very deep A-Bt-Cr profile soils with a paralithic contact to weathered bedrock below 100 or 150 cm depth. They are well drained.

Representative Pedon RC24. - N½, sec. 20, R37N, R2E, Skunk Ridge Quadrangle.

Classification: medial over fine-loamy, frigid Ultic Haploxerands

Altitude: 4880 feet

Slope: convex (convex along contour, also) N 12% smooth

Surface Stoniness: 10% gravel, 3% cobbles, 2% "stones", 1% boulders

Oi 6-2 cm; loose over weakly matted conifer needles

Oe 2-0 cm; weathered fragments of conifer needles, and humus

A1 0-8 cm; very dark reddish brown (5YR 2/2) gravelly sandy loam, dark reddish gray (5YR 4/2) dry; strong, very fine granular; soft, slightly sticky, nonplastic; few very fine roots; very highly hydrophobic; strongly acid; clear, smooth boundary.

- A2 8-20 cm; dark reddish brown (5YR 2/3) gravelly sandy loam, reddish brown (5YR 4/3) dry; strong, very fine, granular; very friable, slightly sticky, nonplastic; common very fine, fine, medium, and coarse roots; moderately hydrophobic; moderately acid; clear, wavy boundary.
- AB 20-35 cm; dark reddish brown (2.5YR 3/4) gravelly sandy loam, reddish brown (5YR 5/4) dry; weak, very fine, subangular blocky; very friable; slightly sticky, nonplastic; common fine, medium, and coarse roots; slightly hydrophobic; moderately acid; pH 11.4 in NaF; gradual, smooth boundary.
- Bt1 35-54 cm; yellowish red (5YR 4/6) gravelly sandy clay loam; moderate, medium, subangular blocky; friable; slightly sticky, slightly plastic; few, thin coatings on ped faces; few fine, medium, and coarse roots; strongly acid; gradual, smooth boundary.
- Bt2 54-90 cm; strong brown (7.5YR 5/6) very gravelly clay loam; weak, coarse, subangular blocky; firm; sticky, plastic; discontinuous, thin strong brown (5-7.5YR 4/6 dry) coatings on ped faces; very few fine, medium, and coarse roots; very strongly acid; diffuse boundary.
- BC 90-150+ cm; yellowish brown (10YR 5/6) very gravelly clay loam; massive; firm, sticky, plastic; very few fine and medium roots; Truog pH indicator color fades to colorless.
- Note: stones are hard in A horizon, with increased weathering downward to soft stones in lower part of B horizon.

Potential Natural Plant Community - White fir/bush chinquapin. The cover is dense conifer forest, with at least 15% white fir and no more than 5% black oak. White fir is a dominant or codominant conifer and there are white fir seedlings in the understory. Shrubs, other than bush chinquapin, and herbaceous plants are scarce, although shrubs and many herbaceous plants are common in successional stages of this potential natural plant community.

Plants at representative site RC24.

Tree cover, 90%: *Abies concolor*, 80%; *Pinus ponderosa*, 5%; and *Pinus lambertiana* 5%; Shrub cover, 10%: *Chrysolepis sempervirens*, 10%; and *Pachistima myrsinites* < 1%. Forb cover, 5%: *Chimaphila umbellata*, 3%; *Chimaphila menziesii*, 1%; and *Pyrola picta* < 1%, and *Hieracium albiflorum* < 1%. White fir seedlings are present in the understory. The stand was thinned several years before it was described.

ET 336-3

andesite or basalt mountain sideslopes : Humic Haploxerands : white fir/vine maple

Geomorphology - Fluvial-Eroding Hill (Mountain) Slopes. The landforms are gently sloping broad ridges to moderately slopes at the edges of plateaus and benches. The benches are old flow surfaces bounded by steep slopes on both upper and lower edges. Fluvial erosion by overland flow of water, and chemical erosion by weathering and leaching are the most important geomorphic processes in this ET.

Soils - Humic Haploxerands. They are medial-skeletal, frigid Humic Haploxerands. These are very deep A-Bw-Cr profile soils with a lithic or a paralithic contact to weathered bedrock at 50 to > 150 cm depth. They are well drained.

Pedon at site RC01 is representative of these soils.

Potential Natural Plant Community - White fir/vine maple. The cover is dense conifer forest, with at least 15% white fir and no more than 5% black oak. White fir is a dominant or codominant conifer and there are white fir seedlings in the understory. Vine maple is generally present and more abundant than bush chinquapin. Herbaceous plants are scarce, although shrubs and many herbaceous plants are common in successional stages of this potential natural plant community.

Vegetation at site RC01 is representative of this plant community.

337 JAKE SPRING NONFOREST, 25 to 60% slopes

EMU 337 is on steep mountain sideslopes above the Delucci hillocks. The landform is similar to that of Jake Spring Mountain Sideslope (EMU 331), but EMU is almost exclusively on or about south or southwest-facing slopes, rather than on or about north or northeast-facing slopes. The altitude range is 3,000 to 3,640 feet (910 to 1110 m), and the mean annual precipitation is about 40 to 60 inches (100 to 150 cm).

Lithology - andesite or basalt. These and late Tertiary basalt and andesite flows, and some andesitic to silicic breccias and tuff-breccias.

Map Unit Composition

- 40% andesite or basalt mountain sideslopes : Typic Argixerolls : white oak/birchleaf mountain mahogany/annual grass
- 30% andesite or basalt mountain sideslopes : Ultic Argixerolls : white oak/birchleaf mountain mahogany
- 20% andesite or basalt mountain sideslopes : Lithic Argixerolls : wedgeleaf ceanothus/annual grass
- 10% Inclusions: rock outcrop; and Lithic Haploxerolls with shrubs and annual grass

ET 337-1

basalt or andesite mountain sideslopes : Typic Argixerolls : white oak/birchleaf mountain mahogany/annual grass

Geomorphology - Eroding Hill (Mountain) Slopes. The landform is steep mountain sideslopes. Fluvial erosion by overland flow of water is the most important geomorphic processes in this ET.

Soils - Typic Argixerolls. They are loamy-skeletal, mixed, mesic Typic Argixerolls. These are moderately deep to deep A-Bt-R or A-Bt-Cr profile soils with a lithic or a paralithic contact to weathered bedrock between 50 and 150 cm depth. They are well drained.

Pedon at site RC18 in ET 352-1 is representative of the soils in this ET.

Potential Natural Plant Community - white oak/birchleaf mountain mahogany/annual grass. The cover is sparse white oak trees, open shrub, and annual grass among the shrubs. The shrubs are predominantly birchleaf mountain mahogany. Rattail fescue, soft chess, and Japanese chess are common grasses.

Vegetation at site RC18 in ET 352-1 is representative of that in this plant community.

ET 337-2

basalt or andesite mountain sideslopes : Ultic Argixerolls : white oak/birchleaf mountain mahogany

Geomorphology - Undifferentiated Hill (Mountain) Slopes. The landform is steep mountain sideslopes. Mass wasting by flow and fluvial erosion by overland flow of water are both important geomorphic processes in this ET.

Soils - Ultic Argixerolls. They are fine-loamy and loamy-skeletal, mixed, mesic Ultic Argixerolls. These are deep to very deep A-Bt-C profile soils > 100 cm deep in colluvium. They are well drained.

Representative Pedon RC07. - middle, sec. 26, R37N, R2E, Burney Falls Quadrangle.

Classification: fine-loamy, mixed, mesic Ultic Argixerolls

Altitude: 3480 feet

Slope: convex (convex along contour, also) N 27% smooth

Surface Stoniness: 10% gravel, 5% cobbles, 2% "stones", 1% boulders

Oi 2-0 cm; loose shrub leaves

A1 0-4 cm; dark brown (7.5YR 3/2) gravelly silt loam, brown (7.5YR 4/3) dry; moderate, fine granular; slightly hard, sticky, slightly plastic; few very fine roots; slightly acid; abrupt, smooth boundary.

A2 4-18 cm; dark brown (7.5YR 3/2) gravelly silt loam, brown (10YR 5/3) dry; weak, fine and medium, subangular blocky; slightly hard, sticky, slightly plastic; common very fine, fine, and medium roots; slightly acid; clear, wavy boundary.

2BA1 18-48 cm; dark brown (7.5YR 3/3) gravelly clay loam; moderate, very fine and fine, subangular blocky; firm; sticky, plastic; discontinuous, thin coatings on ped faces; few fine, medium, and coarse roots; moderately acid; clear, smooth boundary.

3Bt 48-88 cm; dark brown (7.5YR 3/4) silty clay loam; moderate, fine and medium, subangular blocky; very firm; very sticky, plastic; continuous, thin coatings on ped faces; very few fine and medium roots; moderately acid; gradual, smooth boundary.

3BCt 88-110+ cm; dark yellowish brown (10YR 4/4) silty clay loam; moderate, fine subangular blocky; very firm; sticky, plastic; continuous, moderately thick coatings on ped faces; moderately to slightly acid.

Potential Natural Plant Community - white oak/birchleaf mountain mahogany. The cover is open white oak woodland, dense shrub, and grass among the shrubs. The shrubs are predominantly birchleaf mountain mahogany and lesser amounts of wedgeleaf ceanothus and greenleaf manzanita. Japanese chess and western fescue are common grasses.

Plants at representative site RC07.

Tree cover, 20%: *Quercus garryana*. Shrub cover, 70%: *Cercocarpus betuloides*, 40%; *Ceanothus cuneatus*, 20%; *Arctostaphylos patula*, 10%; and *Prunus subcordata* < 1%. Forb cover, < 1%: *Epilobium brachycarpum*, *Clarkia rhomboidea*, and Cichoreae. Graminoid cover, 25%: *Bromus japonicus*, 20%; *Festuca occidentalis*, 5%; and *Elymus glaucus* < 1%.

ET 337-3

basalt or andesite mountain sideslopes : Lithic Argixerolls : wedgeleaf ceanothus/annual grass

Geomorphology - Undifferentiated Hill (Mountain) Slopes. The landform is steep mountain and canyon sideslopes. Mass wasting by flow and fluvial erosion by overland flow of water are both important geomorphic processes in this ET.

Soils - Lithic Argixerolls. They are loamy-skeletal, mixed, mesic Lithic Argixerolls. These are shallow A-Bt-R profile soils with hard bedrock at about 18 to 50 cm depth. They are well drained.

Representative Pedon RC19. - E½, sec. 18, R37N, R3E, Burney Falls Quadrangle.

Classification: loamy-skeletal, mixed, mesic Lithic Argixerolls

Altitude: 3080 feet

Slope: convex (convex along contour, also) S 32% smooth

Surface Stoniness: 20% gravel, 10% cobbles, 3% "stones", no boulders

Oi 1-0 cm; loose shrub leaves and grass; sediment washed down slope has accumulated in a heap on the upslope side of each shrub.

A 0-9 cm; dark brown (7.5YR 3/2) gravelly loam, brown (10YR 4/3) dry; weak, medium, prismatic; cracks at ground surface 2 to 3 mm wide in late August; very hard, slightly sticky, slightly plastic; few very fine roots; neutral; clear, wavy boundary.

Bt 9-22 cm; dark brown (7.5YR 3/3) very gravelly clay loam; moderate, medium, prismatic; very hard; sticky, plastic; few fine roots; slightly acid; abrupt, irregular boundary.

R 22+ cm; hard andesite or basalt.

Potential Natural Plant Community - wedgeleaf ceanothus/annual grass. The cover is open shrub and dense grass among the shrubs. The shrubs are predominantly wedgeleaf ceanothus and lesser amounts of birchleaf mountain mahogany. Soft chess and rattail fescue are common grasses.

Plants at representative site RC19.

Tree cover, 0%. Shrub cover, 40%: *Cercocarpus betuloides*, 10%; and *Ceanothus cuneatus*, 30%. Forb cover, 5%: *Epilobium brachycarpum* 2%; and many species dried and unidentifiable in late August. Graminoid cover, 50%: *Bromus hordeaceus*, 40%; *Vulpia myuros*, 10%; and *Bromus diandrus*, < 1%.

Note: Less soft chess and larger proportion of rattail fescue in eroded spots.

339 PIT RIVER FORESTED INNER GORGE, 60 to 85% slopes

EMU 339 is very steep slopes of the Pit River inner-gorge. The inner-gorge is characterized by linear slopes that have gradients near the angle of repose for the materials on the slopes. That happens to be about 72 to 85% for the volcanic rocks in this EMU. Less steep slopes on talus and finer colluvium at the foot of long linear slopes are relatively short. Alluvial fans that spread over terraces and floodplains at the bottom of the inner-gorge are relatively nonextensive. The altitude range is 2,400 to 3,720 feet (730 to 1130 m), and the mean annual precipitation is 50 to 60 inches (125 to 150 cm).

Lithology - middle to late Tertiary andesite and basalt flow rock and andesitic and more silicic breccias and tuff-breccias. These rocks may belong to the western Cascade group (McDonald, 1966) which ranges in age from Eocene to early Pliocene Hammond (1979).

Map Unit Composition

- 40% ET 339-1 - andesite inner-gorge : Typic Xerochrepts : Douglas-fir--canyon live oak
- 20% ET 339-2 - andesite inner-gorge : Lithic Mollic Haploxeralfs : canyon live oak
- 20% ET 339-3 - andesite inner-gorge : fragmental colluvium : barren
- 20% Inclusions: Lithic Xerorthents or Lithic Haploxerolls with canyon live oak and shrubs on spur ridges; and Typic or Dystric Xerorthents with Douglas-fir--canyon live oak on recent colluvium.

ET 339-1

andesite inner-gorge : Typic Xerochrepts : Douglas-fir--canyon live oak

Geomorphology - Mass Wasting/Flow. The landform is inner-gorge sideslopes that are in the Pit River canyon. These slopes are very steep and mostly linear. Debris flow is the predominant geomorphic processes in this ET.

Soils - Typic Xerochrepts. They are loamy-skeletal, mixed, mesic Typic Xerochrepts. These are very deep A-Bw-C or A-Bt-C profile soils > 150 cm deep in colluvium. The gradual and slight clay increase downward into the Bt horizon, where it is present, is generally insufficient to make it an argillic horizon. The soils are somewhat excessively well drained.

Representative Pedon RC27. - NW¼, sec. 11, R36N, R2E, Burney Quadrangle.

Classification: loamy-skeletal, mixed, mesic Typic Xerochrept

Altitude: 3040 feet

Slope: linear (linear along contour, also) N 85%

Surface Stoniness: 60% gravel, 15% cobbles, 5% "stones", 2% boulders

Oi 2-0 cm; loose over slightly matted conifer needles and broad leaves

A 0-5 cm; dark brown (7.5YR 3/3) very gravelly loam, brown (10YR 5/3) dry; strong, fine granular; soft, slightly sticky, nonplastic; few very fine roots; moderately hydrophobic; strongly to moderately acid; clear, smooth boundary.

AB 5-14 cm; dark brown (7.5YR 3/4) very gravelly loam, pinkish gray (7.5YR 6/3) dry; moderate, fine granular; soft, slightly sticky, nonplastic; common very fine, fine, and medium roots; nonhydrophobic; moderately acid; gradual, smooth boundary.

BA 14-45 cm; dark brown (7.5YR 3/4) very gravelly loam; moderate, very fine, subangular blocky; very friable, slightly sticky, nonplastic; common fine, medium, and coarse roots; moderately to slightly acid; diffuse boundary.

Bt 44-110+ cm; brown (7.5YR 4/4) extremely gravelly loam; moderate, fine subangular blocky; friable, sticky, slightly plastic; few, thin coatings on ped faces; few fine, medium, and coarse roots; slightly acid; gradual, smooth boundary.

Note: all stones hard, negligible weathering rinds.

Potential Natural Plant Community - white oak/birchleaf mountain mahogany/annual grass. The cover is open white oak woodland, dense shrub, and grass among the shrubs. The shrubs are predominantly birchleaf mountain mahogany and lesser amounts of wedgeleaf ceanothus and greenleaf manzanita. Japanese chess and western fescue are common grasses.

Plants at representative site RC27.

Tree cover, 80%: *Pseudotsuga menziesii*, 60%; *Abies concolor* < 1%; *Pinus lambertiana* < 1%; *Quercus chrysolepis*, 20%; *Quercus kelloggii*, 5%; *Acer macrophyllum*, 5%; and *Cornus nuttallii*, 1%. Shrub cover, 7%: *Symphoricarpos mollis*, 3%; *Ceanothus integerrimus*, 1%; *Toxicodendron diversiloba*, 2%; *Rosa gymnocarpa*, 1%; *Chamaebatia foliolosa*, 1%; and *Ribes* sp, 1%. Forb cover, 4%: *Trientalis latifolia*, 3%; and *Epilobium brachycarpum*, *Polygala cornuta*, *Galium bolanderi*, *Campanula prenanthoides*, *Hieracium albiflorum*, and *Saxifraga* sp, each < 1%. Graminoid cover, 2%: *Festuca californica*, 2%; and *Carex multicaulis* < 1%. Ferns, 1%. *Polysticum* sp.

ET 339-2

andesite inner-gorge : Lithic Mollic Haploxeralfs : canyon live oak

Geomorphology - Mass Wasting/Flow. The landform is inner-gorge sideslopes that are in the Pit River canyon. These slopes are very steep and mostly linear. Debris flow is the predominant geomorphic processes in this ET, although there may be appreciable fluvial erosion by overland flow of water, too. Ground surfaces are commonly sufficiently stable for argillic horizons to form in the shallow soils.

Soils - Lithic Mollic Haploxeralfs. They are loamy-skeletal, mixed, mesic Lithic Mollic Xerochrepts. These are shallow A-Bt-R profile soils with hard bedrock at 18 to 50 cm depth. They are somewhat excessively well drained.

Representative Pedon RC26. - NW¼, sec. 11, R36N, R2E, Burney Quadrangle.

Classification: loamy-skeletal, mixed, mesic Lithic Mollic Haploxeralf

Altitude: 3080 feet

Slope: linear (convex along contour) W 82%

Surface Stoniness: 40% gravel, 10% cobbles, 3% "stones", 1% boulders

Oi 2-0 cm; discontinuous layer of loose oak leaves

A 0-5 cm; dark brown (7.5YR 3/2) very gravelly loam, grayish brown (10YR 5/2) dry; moderate, fine granular; soft, slightly sticky, nonplastic; few very fine roots; highly hydrophobic; slightly acid to neutral; abrupt, wavy boundary.

AB 5-14 cm; dark brown (7.5YR 3/3) very gravelly loam, brown (7.5YR 5/3) dry; weak, medium, subangular blocky; slightly hard, sticky, slightly plastic; common fine and medium roots; slightly hydrophobic; moderately to slightly acid; clear, wavy boundary.

Bt1 14-28 cm; reddish brown (5YR 4/3) extremely gravelly clay loam; moderate, fine, subangular blocky; firm, sticky, plastic; common fine, medium, and coarse roots; moderately to slightly acid; gradual, smooth boundary.

Bt2 28-42 cm; reddish brown (5YR 4/4) extremely gravelly clay loam; moderate, very fine subangular blocky; firm, sticky, plastic; continuous, thin coatings on ped faces; common fine, medium, and coarse roots; moderately to slightly acid; abrupt, irregular boundary.

R 42+ cm; highly fractured andesite, fractures 10 to 30 cm apart.

Note: depth to bedrock ranges from 32 to 52 cm in hand-dug pit.

Potential Natural Plant Community - Canyon Live Oak. The cover is dense canyon live oak forest, with sparse black oak. There is very little understory.

Plants at representative site RC26.

Tree cover, 85%: *Quercus chrysolepis*, 80%; *Quercus kelloggii*, 5%; and *Pinus ponderosa*, 1%. Shrub cover, 2%: *Symphoricarpos mollis* < 1%; and *Toxicodendron diversiloba*, 2%. Forb cover, 0%. Graminoid cover, < 1%: *Carex multicaulis* < 1%.

ET 339-3

andesite inner-gorge : fragmental colluvium : barren

Geomorphology - mass wasting/talus. These are angular rock fragments that have accumulated on very steep slopes and on foot slopes below rock outcrop. They are small boulders, or "stones", cobbles, and pebbles; few are large boulders > 60 cm across.

Soils - Xerorthents. No soils were described in this ET. Where there is enough fine earth (particle < 2 mm) between the coarser rock fragments to classify the soils, they are expected to be fragmental, mixed, mesic Typic or Dystric Xerorthents.

Potential Natural Plant Community - barren. There are lichens on the rock fragments but no vascular plants, except near the margins of some patches of fragmental colluvium. Those margins are colonized by sparse stands of naked buckwheat and few other herbaceous plants.

351 DELUCCI NONFORESTED SIDESLOPES, 25-60% slopes

EMU 351 is on steep hill and canyon sideslopes. The canyons are cut in an eroded and no longer level bench between the inner-gorge of the Pit River below and late Cenozoic basalt and

andesite flows above. The altitude range is 2,920 to 3,520 feet (890 to 1070 m) and the mean annual precipitation is 40 to 60 inches (100 to 150 cm).

Lithology - Late Cenozoic strata of volcanic rock, conglomerate, sandstone, and diatomite. Most of the volcanic rock is andesite or basalt. The conglomerate and sandstone have predominantly volcanic clasts. At least some of the diatomite is early Pliocene or older (Aune, 1964). It is white, weathering to a buff color.

Map Unit Composition

- 30% ET 351-1 - andesite or basalt hill slopes : Lithic Argixerolls : wedgeleaf ceanothus/annual grass
- 20% ET 351-2 - andesite or basalt hill slopes : Typic Argixerolls : white oak/birchleaf mountain mahogany/annual grass
- 20% ET 351-3 - andesite or basalt hill slopes : Ultic Argixerolls : white oak/birchleaf mountain mahogany
- 20% ET 351-4 - clastic sedimentary hill slopes : Typic Argixerolls : white oak/greenleaf manzanita
- 20% Inclusions: andesite or basalt rock outcrop; Lithic Xerorthents with shrubs and grass on very steep andesite or basalt hill slopes; and very deep Haploxerolls in colluvium on steep sideslopes and on colluvial footslopes.

ET 351-1

andesite or basalt mountain sideslopes : Lithic Argixerolls : wedgeleaf ceanothus/annual grass

Geomorphology - Undifferentiated Hill (Mountain) Slopes. The landform is steep mountain and canyon sideslopes. Mass wasting by flow and fluvial erosion by overland flow of water are both important geomorphic processes in this ET.

Soils - Lithic Argixerolls. They are loamy-skeletal, mixed, mesic Lithic Argixerolls. These are shallow A-Bt-R profile soils with hard bedrock at about 18 to 50 cm depth. They are well drained.

Pedon at site RC19 in ET 337-3 is representative of the soils in this ET.

Potential Natural Plant Community - wedgeleaf ceanothus/annual grass. The cover is open shrub and dense grass among the shrubs. The shrubs are predominantly wedgeleaf ceanothus and lesser amounts of birchleaf mountain mahogany. Soft chess and rattail fescue are common grasses.

Vegetation at site RC19 in ET 337-3 is representative of this plant community.

ET 351-2

andesite or basalt mountain sideslopes : Typic Argixerolls : white oak/birchleaf mountain mahogany/annual grass

Geomorphology - Eroding Hill (Mountain) Slopes. The landform is steep mountain sideslopes. Fluvial erosion by overland flow of water is the most important geomorphic processes in this ET.

Soils - Typic Argixerolls. They are loamy-skeletal, mixed, mesic Typic Argixerolls. These are moderately deep to deep A-Bt-R or A-Bt-Cr profile soils with a lithic or a paralithic contact to weathered bedrock between 50 and 150 cm depth. They are well drained.

Pedon at site RC18 in ET 352-1 is representative of the soils in this ET.

Potential Natural Plant Community - white oak/birchleaf mountain mahogany/annual grass. The cover is sparse white oak trees, open shrub, and annual grass among the shrubs. The shrubs are predominantly birchleaf mountain mahogany. Rattail fescue, soft chess, and Japanese chess are common grasses.

Vegetation at site RC18 in ET 352-1 is representative of that in this ET.

ET 351-3

andesite or basalt mountain sideslopes : Ultic Argixerolls : white oak/birchleaf mountain mahogany

Geomorphology - Undifferentiated Hill (Mountain) Slopes. The landform is steep mountain sideslopes. Mass wasting by flow and fluvial erosion by overland flow of water are both important geomorphic processes in this ET.

Soils - Ultic Argixerolls. They are fine-loamy and loamy-skeletal, mixed, mesic Ultic Argixerolls. These are deep to very deep A-Bt-C profile soils > 100 cm deep in colluvium. They are well drained.

Pedon at site RC07 in ET 337-2 is representative of the soils at this site.

Potential Natural Plant Community - white oak/birchleaf mountain mahogany. The cover is open white oak woodland, dense shrub, and grass among the shrubs. The shrubs are predominantly birchleaf mountain mahogany and lesser amounts of wedgeleaf ceanothus and greenleaf manzanita. Japanese chess and western fescue are common grasses.

Vegetation at site RC07 in ET 337-2 is representative of that in this ET.

ET 351-4

clastic sedimentary hill slopes : Typic Argixerolls : white oak/greenleaf manzanita

Geomorphology - Undifferentiated Hill Slopes. The landform is steep hill sideslopes. Mass wasting by flow and fluvial erosion by overland flow of water are both important geomorphic processes in this ET.

Soils - Typic Argixerolls. They are fine-loamy to loamy-skeletal, mixed, mesic Typic Argixerolls. These are moderately deep to deep A-Bt-Cr profile soils with a paralithic contact to soft conglomerate, sandstone, or diatomite between 50 and 150 cm depth. They are well drained.

Pedon at site RC17 in ET 352-2 is representative of these soils.

Potential Natural Plant Community - white oak/greenleaf manzanita. The cover is open white oak trees and dense shrub. The shrubs are predominantly greenleaf manzanita.

Vegetation at site RC17 in ET 352-2 is representative of that in this plant community.

ET 352 DELUCCI NONFORESTED HILLOCKS, 3-30% slopes

EMU 352 is on gently sloping to moderately steep hillocks. Hillocks are hills with relatively little vertical relief. They are on an eroded and no longer level bench between the inner-gorge of the Pit River below and late Cenozoic basalt and andesite flows above. The altitude range is 2,880 to 3,600 feet (880 to 1100 m) and the mean annual precipitation is 50 to 60 inches (100 to 150 cm).

Lithology - Late Cenozoic strata of volcanic rock, conglomerate, sandstone, and diatomite. Most of the volcanic rock is andesite or basalt. The conglomerate and sandstone have predominantly volcanic clasts. At least some of the diatomite is early Pliocene or older (Aune, 1964). It is white, weathering to a buff color.

Map Unit Composition

- 40% ET 352-1 - andesite or basalt hillocks : Typic Argixerolls : white oak/birchleaf mountain mahogany/annual grass
- 30% ET 352-2 - clastic sedimentary hillocks : Typic Argixerolls : white oak/greenleaf manzanita
- 10% ET 352-3 - sandstone hillocks : Leptic Haploxererts : white oak/wedgeleaf ceanothus/annual grass
- 20% Inclusions: andesite or basalt rock outcrop; Lithic Argixerolls on moderately steep andesite or basalt slopes with shrubs and annual grass; and moderately deep Vitrandic Xerochrepts on diatomite with mixed conifers and black oak

ET 352-1

andesite or basalt hillocks : Typic Argixerolls : white oak/birchleaf mountain mahogany/annual grass

Geomorphology - Eroding Hill (Mountain) Slopes. The landform is steep mountain sideslopes. Fluvial erosion by overland flow of water is the most important geomorphic processes in this ET.

Soils - Typic Argixerolls. They are loamy-skeletal, mixed, mesic Typic Argixerolls. These are moderately deep to deep A-Bt-R or A-Bt-Cr profile soils with a lithic or a paralithic contact to weathered bedrock between 50 and 150 cm depth. They are well drained.

Representative Pedon RC18. - NW¼, SW¼, sec. 34, R37N, R2E, Burney Falls Quadrangle.

Classification: loamy-skeletal, mixed, mesic Typic Argixerolls

Altitude: 3320 feet

Slope: convex (convex along contour, also) N 27% smooth

Surface Stoniness: 10% gravel, 5% cobbles, 2% "stones", 1% boulders

Oi 2-0 cm; loose shrub leaves and grass

A1 0-7 cm; dark brown (7.5YR 3/2) loam, brown (10YR 4/3) dry; moderate, very fine, subangular blocky; slightly hard, slightly sticky, slightly plastic; few very fine roots; neutral; clear, wavy boundary.

- A2 7-26 cm; dark brown (7.5YR 3/2) very gravelly loam, brown (10YR 4/3) dry; moderate, fine, subangular blocky; friable, slightly sticky, slightly plastic; common very fine, fine, and medium roots; slightly acid; gradual, smooth boundary.
- Bt1 26-48 cm; dark brown (7.5YR 3/4) very gravelly clay loam; moderate, medium, subangular blocky; firm; sticky, plastic; discontinuous, thin coatings on ped faces; few fine, medium, and coarse roots; moderately to slightly acid; gradual, smooth boundary.
- Bt2 48-76 cm; brown (7.5YR 3/4) extremely gravelly sandy clay loam; moderate, medium, subangular blocky; firm; sticky, plastic; continuous, moderately thick coatings on ped faces; very few fine and medium roots; moderately acid; abrupt, irregular boundary.
- Cr 76+ hard volcanic rock in a matrix weathered soft.

Potential Natural Plant Community - white oak/birchleaf mountain mahogany/annual grass. The cover is sparse white oak trees, open shrub, and annual grass among the shrubs. The shrubs are predominantly birchleaf mountain mahogany. Rattail fescue, soft chess, and Japanese chess are common grasses.

Plants at representative site RC18.

Tree cover, 10%: *Quercus garryana*, 10. Shrub cover, 50%: *Cercocarpus betuloides*, 40%; *Ceanothus cuneatus*, 5%; and *Arctostaphylos patula*, 5%. Forb cover, 1%: *Epilobium brachycarpum*, 1%. Graminoid cover, 60%: *Vulpia myuros*, 40%; *Bromus hordeaceus*, 15%; and *Bromus japonicus*, 5%.

ET 352-2

clastic sedimentary hillocks : Typic Argixerolls : white oak/greenleaf manzanita

Geomorphology - Fluvial-Eroding Hill Slopes. The landform is gently sloping to moderately steep hill sideslopes. Fluvial erosion by overland flow of water is the dominant geomorphic processes in this ET.

Soils - Typic Argixerolls. They are fine-loamy to loamy-skeletal, mixed, mesic Typic Argixerolls. These are moderately deep to deep A-Bt-Cr profile soils with a paralithic contact to soft conglomerate, sandstone, or diatomite between 50 and 150 cm depth. They are well drained.

Representative Pedon RC17. - W½, SE¼, sec. 35, R37N, R2E, Burney Falls Quadrangle.

Classification: fine-loamy, mixed, mesic Typic Argixerolls

Altitude: 2920 feet

Slope: convex (convex along contour, also) NNE 46% smooth

Surface Stoniness: 5% gravel, cobbles < 1%, no "stones", no boulders

Oi 3-0 cm; loose shrub and oak leaves

A 0-8 cm; dark brown (7.5YR 3/3) silt loam, brown (7.5YR 4/3) dry; fine, granular; soft; sticky, slightly plastic; common very fine roots; neutral; clear, wavy boundary.

AB 8-24 cm; dark brown (7.5YR 3/3) gravelly silty clay loam, brown (7.5YR 4/4) dry; moderate, fine, subangular blocky; slightly hard, friable, sticky, plastic; common fine, medium, and coarse roots; moderately acid; gradual, smooth boundary.

Bt 24-46 cm; dark brown (7.5YR 3/4) gravelly clay loam; moderate, medium, subangular blocky; firm; sticky, plastic; discontinuous, thin coatings on ped faces; few fine, medium, and coarse roots; slightly acid; gradual, smooth boundary.

BC 46-58 cm; brown (7.5YR 4/4) very gravelly sandy clay loam; massive; firm; sticky, plastic; few fine and medium roots; slightly acid; abrupt, irregular boundary.

2Cr 58-60+ moderately fractured (cracks 10 to 30 cm apart) buff-colored diatomite.

Note: pebbles from conglomerate > 90% mafic volcanic rock.

Potential Natural Plant Community - white oak/greenleaf manzanita. The cover is open white oak trees and dense shrub. The shrubs are predominantly greenleaf manzanita.

Plants at representative site RC17.

Tree cover, 40%: *Quercus garryana*, 40. Shrub cover, 80%: *Arctostaphylos patula*, 60%; *Prunus emarginata*, 10%; *Amelanchier utahensis*, 1%. Forb cover, < 1%: *Clarkia rhomboidea*. Graminoid cover, < 1%: *Carex multicaulis*.

ET 352-3

sandstone hillocks : Leptic Haploxererts : white oak/wedgeleaf ceanothus/annual grass

Geology - late Cenozoic sandstone. These clastic sedimentary rocks are soft sandstones with clasts of predominantly volcanic rock fragments.

Geomorphology - Undifferentiated Hill Slopes. The landform is gentle to moderately steep hill summit and sideslopes. Mass wasting by soil creep and fluvial erosion by overland flow of water are both important geomorphic processes in this ET.

Soils - Leptic Haploxererts. They are fine, montmorillonitic, mesic Leptic Haploxererts. These are moderately deep A-AC-Cr profile soils with a paralithic contact to soft sandstone between 50 and 100 cm depth. Vertical cracks open several millimeters wide during late summer. The soils are well drained.

Representative Pedon RC02. - NE¼, SE¼, sec. 35, R37N, R2E, Burney Falls Quadrangle.

Classification: fine, montmorillonitic, mesic Leptic Haploxererts

Altitude: 3040 feet

Slope: convex (convex along contour, also) ESE 16% smooth

Surface Stoniness: 1% gravel, cobbles < 1%, no "stones", no boulders

Oi 1-0 cm; discontinuous layer of loose oak leaves

A1 0-7 cm; very dark grayish brown (10YR 3/2) silty clay loam, brown (10YR 5/3) dry; moderate, medium, subangular blocky and moderate, fine, granular; hard, very sticky, plastic; few very fine roots; slightly acid; clear, smooth boundary.

A2 7-42 cm; very dark grayish brown (10YR 3/2) clay; strong, coarse, prismatic; vertical cracks 3 mm wide and oblique slickensides; extremely firm, very sticky, very plastic; few fine and medium and very few coarse roots; slightly acid; gradual, smooth boundary.

AC 42-65 cm; dark yellowish brown (10YR 3/4) clay loam, dark brown (7.5YR 3/2) on ped faces; moderate, coarse, prismatic; vertical cracks 1 mm wide and oblique slickensides; very firm, very sticky, plastic; very few fine and medium roots; neutral; abrupt, irregular boundary.

Cr 65-80+ cm; buff-colored sandstone, pale brown (10YR 7/4) dry, with common, medium 7.5YR 5/6 and few, fine 7.5YR 3/2 mottles; horizontal stratification; roots along vertical cracks; neutral.

Note: stones (sparse) are subangular to round mafic volcanic rock.

Potential Natural Plant Community - white oak/wedgeleaf ceanothus/annual grass. The cover is sparse to open white oak trees and open shrub. The shrubs are predominantly wedgeleaf ceanothus. Yampah is a characteristic herbaceous plant in this ET.

Plants at representative site RC02.

Tree cover, 20%: *Quercus garryana*, 20. Shrub cover, 40%: *Ceanothus cuneatus*, 40%; and *Lonicera* sp < 1%. Forb cover, 6%: *Perideridia (bolanderi?)*, 3%; *Blepharipappus scaber*, 2%; *Hesperolinon micranthum*, 1%; and *Clarkia rhomboidea*, *Epilobium brachycarpum*, and *Calystegia* sp, each < 1%. Graminoid cover, 22%: *Bromus japonicus*, 20%; *Elymus elymoides*, 2%; and *Achnatherum occidentale* < 1%. Many forbs had dried and were unidentifiable when the site was described in August, 1995.

353 - DELUCCI FORESTED HILLS, 25-60% slopes

EMU 353 is on steep hill and canyon sideslopes. The canyons are cut in an eroded and no longer level bench between the inner-gorge of the Pit River below and late Cenozoic basalt and andesite flows above. The altitude range is 2,880 to 3,800 feet (890 to 1160 m) and the mean annual precipitation is 40 to 60 inches (100 to 150 cm).

Lithology - Late Cenozoic strata of volcanic rock, conglomerate, sandstone, and diatomite. Most of the volcanic rock is andesite or basalt. The conglomerate and sandstone have predominantly volcanic clasts. At least some of the diatomite is early Pliocene or older (Aune, 1964). It is white, weathering to a buff color.

Map Unit Composition

- 40% ET 353-1 - andesite or basalt hill slopes : Vitrandic Haploxeralfs : mixed conifer-black oak
- 30% ET 353-2 - diatomite hill slopes : Vitrandic Xerochrepts : mixed conifer-black oak
- 20% ET 353-3 - clastic sedimentary hill slopes : Vitrandic Haploxeralfs : mixed conifer-black oak
- 10% Inclusions: very deep Vitrandic Haploxeralfs and Vitrandic Palexeralfs in old colluvium.

ET 353-1

andesite or basalt hill slopes : Vitrandic Haploxeralfs : mixed conifer-black oak

Geomorphology - Undifferentiated Hill (Mountain) Slopes. The landform is steep hill and canyon sideslopes. Mass wasting by flow, fluvial erosion by overland flow of water, and chemical denudation by weathering and leaching are all important geomorphic processes in this ET.

Soils - Vitrandic Haploxeralfs. They are loamy-skeletal, oxidic, mesic Vitrandic Haploxeralfs. These are moderately deep to deep A-Bt-R or A-Bt-Cr profile soils with a lithic or a paralithic contact to weathered bedrock between 60 and 150 cm depth. They are well drained.

Pedons at sites RC14 in ET 354-1 and RC25 in ET 331-1 are representative of these soils.

Potential Natural Plant Community - Mixed conifer-black oak. The cover is mixed conifer forest, with at least 5% black oak trees. Shrubs and herbaceous plants are scarce, although deerbrush and many herbaceous plants are common in successional stages of this potential natural plant community. Mountain misery has invaded many sites.

Plants at sites RC14 in ET 354-1 and RC25 in ET 331-1 are representative of those in ET 353-1.

ET 353-2

diatomite hill slopes : Vitrandic Xerochrepts : mixed conifer--black oak

Geomorphology - Fluvial-Eroding Hill Slopes. The landform is steep hill and canyon sideslopes. Fluvial erosion by overland flow of water is the predominant geomorphic processes in this ET.

Soils - Vitrandic Xerochrepts. They are fine-loamy, mixed, mesic Vitrandic Xerochrepts. These are moderately deep to deep A-Bw-Cr profile soils with a paralithic contact to soft bedrock between 50 and 100 cm depth. They are well drained.

Representative Pedon RC16. - E½, W½, sec. 3, R36N, R2E, Burney Falls Quadrangle.

Classification: loamy-skeletal, mixed, oxidic Vitrandic Xerochrepts

Altitude: 3400 feet

Slope: convex (convex along contour, also) SSW 38% smooth

Surface Stoniness: 5% gravel, no cobbles, no "stones", no boulders

Oi 4-0 cm; loose over slightly matted pine and Douglas-fir needles

A1 0-3 cm; very dark grayish brown (10YR 3/2) silt loam, light brownish gray (10YR 6/2) dry; strong, fine, granular; soft; slightly sticky, slightly plastic; few very fine roots; slightly hydrophobic; moderately acid; abrupt, wavy boundary.

A2 3-14 cm; dark grayish brown (10YR 4/3) silt loam, white (10YR 8/2) dry; massive; soft, slightly sticky, slightly plastic; common very fine, fine, and medium roots; slightly hydrophobic; slightly acid; clear, smooth boundary.

Bw 14-38 cm; dark grayish brown (10YR 4/3) gravelly silt loam, white (10YR 8/2) dry; weak, very fine, subangular blocky; soft, very friable, slightly sticky, slightly plastic; common fine, medium, and coarse roots; strongly acid; gradual, smooth boundary.

BC 38-68 cm; light brown (7.5YR 6/4) gravelly silt loam, with few, fine yellowish brown (10YR 5/6) mottles; weak, fine, subangular blocky; very friable, slightly sticky, slightly plastic; few fine, medium, and coarse roots; very strongly acid; abrupt, irregular boundary.

Cr 68-80+ cm; buff colored, slightly hard lithologically, highly fractured (cracks < 10 cm apart) diatomite; roots and yellowish red (5YR 4/6 moist) coatings in fractures.

Potential Natural Plant Community - Mixed conifer-black oak. The cover is mixed conifer forest, with at least 5% black oak trees. Shrubs and herbaceous plants are scarce, although deerbrush and many herbaceous plants are common in successional stages of this potential natural plant community. Mountain misery has invaded many sites.

Plants at representative site RC16.

Tree cover, 95%: *Pseudotsuga menziesii*, 20%; *Pinus ponderosa*, 20%; *Pinus lambertiana*, 20%; *Calocedrus decurrens*, 20%; *Abies concolor*, 1%; *Quercus kelloggii*, 10%. Shrub cover, 5%: *Chamaebatia foliolosa*, 5%. Forb cover, 3%: *Polygala cornuta*, 2%; *Galium bolanderi*, 1%; and *Apocynum androsaemifolium* < 1%. Graminoid cover, 4%: *Festuca californica*, 3%; *Achnatherum nelsonii*, 1%; and *Bromus* sp., < 1%.

ET 353-3

clastic sedimentary hill slopes : Vitrandic Haploxeralfs : mixed conifer--black oak

Geomorphology - Undifferentiated Hill (Mountain) Slopes. The landform is steep hill and canyon sideslopes. Mass wasting by flow, fluvial erosion by overland flow of water, and chemical denudation by weathering and leaching are all important geomorphic processes in this ET.

Soils - Vitrandic Haploxeralfs. They are loamy-skeletal, oxidic, mesic Vitrandic Haploxeralfs. These are moderately deep to deep A-Bt-Cr profile soils with a paralithic contact to weathered bedrock between 60 and 150 cm depth. They are well drained.

Representative Pedon RC21. - SE¼, NW¼, sec. 22, R37N, R2E, Burney Falls Quadrangle.

Classification: loamy-skeletal, mixed, oxidic Vitrandic Xerochrepts

Altitude: 3600 feet

Slope: convex (linear along contour) W 52% smooth

Surface Stoniness: 15% gravel, 2% cobbles, 1% "stones", no boulders

Oi 3-0 cm; loose over slightly matted conifer needles and oak leaves

- A1 0-4 cm; dark reddish brown (5YR 3/3) gravelly sandy loam, dark brown (7.5YR 4/4) dry; strong, fine, granular; soft; slightly sticky, nonplastic; common very fine roots; slightly hydrophobic; slightly acid; abrupt, wavy boundary.
- A2 4-12 cm; dark reddish brown (5YR 3/3) sandy loam, brown (7.5YR 5/4) dry; moderate, very fine, subangular blocky; soft, slightly sticky, nonplastic; few very fine roots; slightly hydrophobic; slightly moderately acid; clear, smooth boundary.
- AB 12-32 cm; dark reddish brown (5YR 3/4) very gravelly loam, reddish brown (5YR 5/5) dry; moderate, very fine, subangular blocky; very friable, slightly sticky, nonplastic; common fine, medium, and coarse roots; moderately acid; gradual, smooth boundary.
- Bt1 32-75 cm; dark reddish brown (5YR 3/4) very gravelly sandy clay loam, brown (5YR 5/4) dry; moderate, fine, subangular blocky; friable, sticky, slightly plastic; few, thin coatings on ped faces; few fine and medium roots; strongly acid; diffuse boundary.
- BC 75-130 cm; brown (7.5YR 4/5) extremely gravelly sandy clay loam; weak, medium, subangular blocky; friable, sticky, slightly plastic; many, thin coatings on ped faces; very few fine and medium roots; strongly acid; abrupt, irregular boundary.
- Cr 130-135+ cm; hard stones (rounded pebbles, cobbles, and "stones") in weakly consolidated sandy matrix; cement apparently clay and possibly silica, no effervescence in 10% HCl.
- Note: stones lithologically hard, soft weathering rind thickness increases with depth in soil.

Potential Natural Plant Community - Mixed conifer-black oak. The cover is mixed conifer forest, with at least 5% black oak trees. Shrubs and herbaceous plants are scarce, although deerbrush and many herbaceous plants are common in successional stages of this potential natural plant community.

Plants at representative site RC21.

Tree cover, 90%: *Pseudotsuga menziesii*, 50%; *Pinus ponderosa*, 15%; *Calocedrus decurrens*, 10%; *Abies concolor*, 5%; *Quercus kelloggii*, 15%. Shrub cover, none. Forb cover, 2%: *Iris* sp, 1%; and *Galium bolanderi*, *Chimaphila umbellata*, *chimaphila menziesii*, *Clarkia rhomboidea*, *Campanula prenanthoides*, *Hieracium albiflorum*, and *Penstemon* sp, each < 1%. Graminoid cover, 2%: *Festuca californica*, 2%; and *Carex multicaulis* < 1%. Deerbrush along road.

354 DELUCCI FORESTED HILLOCKS, 3-30% slopes

EMU 354 is on gently sloping to moderately steep hillocks. Hillocks are hills with relatively little vertical relief. They are on an eroded and no longer level bench between the inner-gorge of the Pit River below and late Cenozoic basalt and andesite flows above. The altitude range is 2,720 to 3,640 feet (830 to 980 m) and the mean annual precipitation is 50 to 60 inches (100 to 150 cm).

Lithology - Late Cenozoic strata of volcanic rock, conglomerate, sandstone, and diatomite. Most of the volcanic rock is andesite or basalt. The conglomerate and sandstone have predominantly volcanic clasts. At least some of the diatomite is early Pliocene or older (Aune, 1964). It is white, weathering to a buff color.

Map Unit Composition

- 30% ET 354-1 - andesite or basalt hillocks : Vitrandic Haploxeralfs : mixed conifer-black oak
- 30% ET 354-2 - diatomite hillocks : Vitrandic Xerochrepts : mixed conifer-black oak
- 30% ET 354-3 - andesite or basalt over clastic sedimentary hillocks : Vitrandic Xerochrepts : mixed conifer--black oak
- 10% Inclusions: very deep Vitrandic Haploxeralfs and Vitrandic Palexeralfs on old surface

ET 354-1

andesite or basalt hillocks : Vitrandic Haploxeralfs : mixed conifer-black oak

Geomorphology - Fluvial-Eroding Hill Slopes. The landform is hillocks, or gently sloping to moderately steep hills with low relief. Mass wasting by flow, fluvial erosion by overland flow of water, and chemical denudation by weathering and leaching are all important geomorphic processes in this ET.

Soils - Vitrandic Haploxeralfs. They are loamy-skeletal, oxidic, mesic Vitrandic Haploxeralfs. These are moderately deep to deep A-Bt-R or A-Bt-Cr profile soils with a lithic or a paralithic contact to weathered bedrock between 60 and 150 cm depth. They are well drained.

Representative Pedon RC14. - SE¹/₄, SE¹/₄, sec. 35, R37N, R2E, Burney Falls Quadrangle.

Classification: loamy-skeletal, mixed, oxidic Vitrandic Haploxeralfs

Altitude: 3020 feet

Slope: convex (convex along contour, also) W 4% smooth

Surface Stoniness: 25% gravel, 2% cobbles, 1% "stones", boulders < 1%

Oi 5-2 cm; loose over slightly matted pine and Douglas-fir leaves

Oe 2-0 cm; matted, weathered conifer needle fragments, and humus

A1 0-7 cm; dark reddish brown (5YR 3/3) gravelly loam, brown (7.5YR 5/4) dry; moderate, fine, granular; soft; slightly sticky, nonplastic; few fine and medium roots; slightly hydrophobic; slightly acid; clear, wavy boundary.

A2 7-16 cm; dark reddish brown (5YR 3/3) gravelly loam, brown (7.5YR 5/4) dry; moderate, very fine, subangular blocky; slightly hard, friable, slightly sticky, slightly plastic; common fine and medium roots; moderately to slightly acid; gradual, smooth boundary.

AB 16-36 cm; reddish brown (2.5YR 4/4) very gravelly loam; moderate, fine, subangular blocky; friable, sticky, slightly plastic; common fine, medium, and coarse roots; slightly acid; gradual, smooth boundary.

Bt 36-70 cm; reddish brown (5YR 4/4) very gravelly clay loam; moderate, medium, subangular blocky; very firm; very sticky, plastic; discontinuous, thin coatings on ped faces and moderately thick coatings in tubular pores; few fine and medium roots; slightly acid; diffuse boundary.

BCt 70-110+ cm; reddish brown (5YR 4/5) very gravelly clay loam; weak, medium, subangular blocky; very firm; very sticky, plastic; few, thin coatings on ped faces; few fine and medium roots; slightly acid.

Note: thickness of soft weathering rinds, negligible in A horizon, increases with depth in B horizon.

Potential Natural Plant Community - Mixed conifer-black oak. The cover is mixed conifer forest, with at least 5% black oak trees. Shrubs and herbaceous plants are scarce, although deerbrush and many herbaceous plants are common in successional stages of this potential natural plant community. Mountain misery has invaded many sites.

Plants at representative site RC14.

Tree cover, 95%: *Pseudotsuga menziesii*, 60%; *Pinus ponderosa*, 10%; *Pinus lambertiana*, 5%; *Calocedrus decurrens*, 5%; *Quercus kelloggii*, 15%; *Quercus chrysolepis* < 1%. Shrub cover, < 1%: *Rosa* sp. Forb cover, < 1%: *Polygala cornuta*. Graminoid cover, < 1%: *Festuca californica*. Note: *Chamaebatia foliolosa* is present on a similar site nearby, and *Apocynum androsaemifolium* is common along a road.

ET 354-2

diatomite hillocks : Vitrandic Xerochrepts : mixed conifer--black oak

Geomorphology - Fluvial-Eroding Hill Slopes. The landform is steep hill and canyon sideslopes. Fluvial erosion by overland flow of water is the predominant geomorphic processes in this ET.

Soils - Vitrandic Xerochrepts. They are fine-loamy, mixed, mesic Vitrandic Xerochrepts. These are moderately deep to deep A-Bw-Cr profile soils with a paralithic contact to soft bedrock between 50 and 100 cm depth. They are well drained.

Pedon at site RC16 in ET 353-2 is representative of these soils.

Potential Natural Plant Community - Mixed conifer-black oak. The cover is mixed conifer forest, with at least 5% black oak trees. Shrubs and herbaceous plants are scarce, although deerbrush and many herbaceous plants are common in successional stages of this potential natural plant community. Mountain misery has invaded many sites.

Plants at representative site RC16 in ET 353-2 are representative of those in this PNC.

ET 354-3

andesite or basalt over clastic sedimentary hillocks : Vitrandic Xerochrepts : mixed conifer--black oak

Geomorphology - Fluvial-Eroding Hill Slopes. The landform is hillocks, or gently sloping hills of low relief. Fluvial erosion by overland flow of water is the predominant geomorphic processes in this ET, although chemical denudation by weathering and leaching is an important process, too.

Soils - Vitrandic Xerochrepts. They are fine-loamy, mixed, mesic Vitrandic Xerochrepts. These are moderately deep to very deep A-Bw-Bt-Cr profile soils with a paralithic contact to soft bedrock between 60 and 150 cm depth, or deeper. Sandstone and diatomite are commonly interstratified. Subsoil horizons in diatomite are generally cambic and those in sandstone are generally argillic horizons. They are well drained.

Representative Pedon RC15. - N½, NE¼, sec. 3, R36N, R2E, Burney Falls Quadrangle.

Classification: fine-loamy, mixed, mesic Vitrandic Xerochrept

Altitude: 3200 feet

Slope: convex (convex along contour, also) N 14% smooth

Surface Stoniness: 5% gravel, no cobbles, no "stones", no boulders

Oi 2-0 cm; loose fir needles and oak leaves over slightly matted fir needles

A1 0-5 cm; dark reddish brown (5YR 3/4) gravelly loam, light brown (7.5YR 6/4) dry; moderate, very fine, subangular blocky; soft; slightly sticky, slightly plastic; few very fine and fine roots; very slightly hydrophobic; moderately acid; abrupt, smooth boundary.

A2 5-16 cm; dark reddish brown (5YR 3/4) gravelly loam, light brown (7.5YR 6/4) dry; moderate, very fine, subangular blocky; friable; slightly sticky, slightly plastic; common fine, medium, and coarse roots; slightly acid; clear, wavy boundary.

Bw 16-38 cm; reddish brown (5YR 4/4) gravelly loam, light reddish brown (5YR 6/4) dry; weak, medium, subangular blocky; friable; very friable, slightly sticky, slightly plastic; few fine, medium, and coarse roots; slightly acid; clear, wavy boundary.

2Bw1 38-64 cm; brown (7.5YR 5/4) silt loam, pink (7.5YR 8/4) dry; massive; friable, slightly sticky, slightly plastic; few fine and medium roots; moderately acid; clear, wavy boundary.

2Bw2 64-75 cm; brown (7.5YR 5/4) silty clay loam, strong brown (7.5YR 5/6) on ped faces; weak, medium, subangular blocky; friable, sticky, plastic; few, thin coatings on ped faces; few fine and medium roots; strongly acid; abrupt, smooth boundary.

3Bt 75-86 cm; yellowish brown (10YR 5/4) clay loam, brown (7.5YR 4/4) on ped faces; moderate, medium, platy; firm, very sticky, plastic; many, thin coatings on ped faces; very few fine and medium roots; moderately acid; abrupt, smooth boundary.

4Bw 86-100 cm; brown (7.5YR 5/4) silt loam; massive; friable, slightly sticky, slightly plastic; very few fine and medium roots; strongly acid; abrupt, smooth boundary.

100-145+ cm; alternate layers of sandstone with Bt horizons and diatomite with Bw horizons.
Note: the silt loam in Bw horizons is highly dilatant.

Potential Natural Plant Community - Mixed conifer-black oak. The cover is mixed conifer forest, with at least 5% black oak trees. White oak trees may be present, but they are sparse. Deerbrush and many herbaceous plants are common in successional stages of this potential natural plant community. Mountain misery has invaded many sites.

Plants at representative site RC15.

Tree cover, 80%: *Pseudotsuga menziesii*, 40; *Pinus ponderosa*, 5%; *Pinus lambertiana*, 5%; *Calocedrus decurrens*, 10%; *Abies concolor* < 1%; *Quercus kelloggii*, 15%; *Quercus garryana*, 5%. Shrub cover, 2%: *Ceanothus integerrimus*, 2%; and *Chamaebatia foliolosa* < 1%. Forb cover, 6%: *Silene lemmonii*, 2%; *Polygala cornuta*, 1%; *Galium bolanderi*, 1%; *Hieracium albiflorum*, 1%; and *Trientalis latifolia*, *Campanula prenanthoides*, *Clarkia rhomboidea*, *Epilobium brachycarpum*, *Apocynum androsaemifolium*, and *Lathyrus* or *Vicia* sp, each < 1%. Graminoid cover, 8%: *Festuca californica*, 5%; *Vulpia myuros*, 2; *Elymus glaucus*, 1%; and *Dactylis glomerata*, *Elymus elymoides*, and *Carex multicaulis*, each < 1%. Fern cover, < 1%: *Polysticum* sp.

360 PIT RIVER ALLUVIAL PLAINS, 0 to 3% slopes

EMU 360 is on nearly level alluvial plains along the Pit River. It includes stream channel, flood plain, and terraces. Flooding has been regulated by a dam and diversion of water from Lake Britton to Pit 3 powerhouse via an aqueduct, reducing the floodplain by converting it to low terrace. The altitude range is 2,400 to 2620 feet (730 to 800 m) and the mean annual precipitation is 50 to 60 inches (100 to 150 cm).

Lithology - Unconsolidated/alluvium. The alluvium is predominantly from volcanic rock. It is recent (Holocene), and possibly late Pleistocene on low terraces. High terraces that are more definitely Pleistocene are inclusions in EMUs 330 and 339.

Map Unit Composition

- 40% ET 360-1 - stream terraces : Xerochrepts & Haploxerolls : mixed conifer--black oak
- 30% ET 360-2 - stream terraces : Haploxeralfs & Xerochrepts : mixed conifer--black oak
- 30% Inclusions: stream channel with alder trees, willow trees and shrubs, and sedges, and, along floodplain margins, cottonwood trees; abandoned channels and floodplain with alder and ash trees and sedges; rock outcrop; Xerochrepts or Haploxeralfs with mixed conifer--black oak--white oak on risers between terraces; and, on the upland sides of terraces, steeply sloping to moderately steep colluvium and alluvial fan

ET 360-1

stream terraces : Xerochrepts & Haploxerolls : mixed conifer--black oak

Geomorphology - Fluvial-Stream Terrace. The landform is nearly level stream terraces. These are low terraces, generally < 10 meters above floodplain. The current geomorphic processes are chemical denudation by weathering and solution loss, deposition of colluvium and alluvial fan sediment on the inner sides of terraces, and fluvial erosion by overland flow of water on the outer edges of terraces.

Soils - Xerochrepts & Haploxerolls. These are deep, well to somewhat excessively well drained soils. None of them were described in this EUI. They are mostly loamy-skeletal, mixed, mesic Typic Xerochrepts and Fluventic or Typic Haploxerolls.

Potential Natural Plant Community - Mixed conifer--black oak. The cover is mixed conifer forest, with at least 5% black oak trees. This is practically a Douglas-fir--black oak plant community, because conifers other than Douglas-fir are sparse. Deerbrush and many herbaceous plants are common in successional stages of this potential natural plant community.

ET 360-2

stream terrace : Haploxeralfs & Xerochrepts : Mixed Conifer--Black Oak

Geomorphology - Fluvial-Stream Terrace. The landform is nearly level stream terraces. These are relatively high terraces, generally > 5 meters above floodplain. The current geomorphic processes are chemical denudation by weathering and solution loss, deposition of colluvium and alluvial fan sediment on the inner sides of terraces, and fluvial erosion by overland flow of water on the outer edges of terraces. Very steep colluvial deposits along the inner sides of terraces were included in EMUs 330 and 339, rather than in this EMU.

Soils - Haploxeralfs & Xerochrepts. These are deep soils, well-drained soils. None were described in this EUI. They are mostly loamy-skeletal, mixed mesic Mollic or Ultic Haploxeralfs and Typic Xerochrepts.

Potential Natural Plant Community - Mixed conifer--black oak. The cover is mixed conifer forest, with at least 5% black oak trees. This is practically a Douglas-fir--black oak plant community, because conifers other than Douglas-fir are sparse. Deerbrush and many herbaceous plants are common in successional stages of this potential natural plant community.

361 GOOSE VALLEY FAN SKIRT, 1 to 6% slopes

bajada fan skirt : Haploxeralfs : ponderosa pine--white oak

EMU 361 is on very gently sloping alluvial skirt around the margin of Goose Valley in the Burney quadrangle. The altitude range is 3,210 to 3,230 feet (980 to 985 m) and the mean annual precipitation is about 45 to 55 inches (115 to 140 cm).

Lithology - Unconsolidated/alluvium. The alluvium is from volcanic rock. It is a Quaternary deposit.

Geomorphology - Fluvial-Bajada Fan Skirt. The landform is alluvial fan skirting the margin of a large flat in the center of the Goose Valley basin. The current geomorphic processes are chemical denudation by weathering and solution loss, deposition of alluvial fan sediment, and fluvial erosion by overland flow of water. Predominance of soils with argillic horizons indicate that the deposition and erosion processes have not been very active recently, during the Holocene.

Soils - Haploxeralfs. These are very deep loamy-skeletal and fine-loamy, mixed, mesic Vitrandic Haploxeralfs similar to those in the Hambone and Boardburn Series of Ultic Haploxeralfs

(Ferrari et al, 1992). They are well drained soils that grade downslope to the somewhat poorly drained Winnibull Series of soils (Ferrari et al., 1992). None of them were described in this EUI.

Potential Natural Plant Community - Ponderosa pine--white oak. The cover is conifers and white oak forest, shrubs, and grass. The conifers are mostly ponderosa pine, little incense-cedar, and very little white fir. The shrubs are deerbrush, greenleaf manzanita, skunkbrush, and mountain misery. Grasses include cheatgrass, rattail fescue, and needlegrass.

362 PEAVINE CREEK FLOODPLAIN, 0 to 3% slopes

floodplain : Umbrepts : riparian

EMU 362 is on nearly level to very gently sloping floodplains. The altitude range is 4,760 to 4,860 feet (1450 to 1480 m) and the mean annual precipitation is about 65 to 70 inches (165 to 180 cm).

Lithology - Unconsolidated/alluvium. The alluvium is from volcanic rock. It is Quaternary deposits, probably Holocene in at least the uppermost part.

Geomorphology - Fluvial-Floodplain. The landform is nearly level to very gently sloping floodplain. The current geomorphic processes are stream erosion and deposition of sediment.

Soils - Umbrepts (and Fluvents). These are very deep soils with little development other than the incorporation of organic matter and formation of soil structure. None of them were described in this EUI. Apparently, most of the soils are fine loamy or fine silty, mixed, frigid Fluventic or Andic Xerumbrepts. Soils in much of the area have been disturbed drastically by mechanical displacement and compaction. Fluvents are minor components of this EMU, occurring along and adjacent to stream channels.

Potential Natural Plant Community - Riparian. The vegetative cover includes lodgepole pine, aspen, and white fir trees, willow and alder shrubs, and herbaceous plants. Spiraea is present, too.

363 SQUAW FLAT BASIN, 0 to 1% slopes

basin-fill : Aquepts : marsh

EMU 363 is on practically level small basin bottom. The altitude is about 4,820 feet (1485 m) and the mean annual precipitation is about 65 inches (165 cm).

Lithology - Unconsolidated/alluvium. The alluvium is basin-fill from volcanic rock. It is Quaternary deposits, probably Holocene in at least the uppermost part. Much of the sediment may have been deposited from standing, rather than moving, water. The distinction between alluvium and lacustrine deposit is blurred in these small basins. That distinction is avoided by referring to the sediments as basin-fill.

Geomorphology - Fluvial-Bolson. The landform is practically level small basin bottom. The current geomorphic processes are predominantly deposition of sediment and also erosion by overland flow of water.

Soils - Aquepts. These are very deep, poorly drained soils. Most of them have thick O and A horizons. They are fine silty, mixed, frigid Humaquepts and presumably Endoaquepts. None of them were described in this EUI.

Potential Natural Plant Community - Marsh. The vegetative cover is predominantly sedges and in some places grasses along with sedges. Bach's downingia is common. Spiraea occurs in clumps. Willows and lodgepole pine are common around the edges of the basins.

Management Interpretations

6.1 Watershed: Soils & Hydrology

Precipitation, watershed relief, terrain topography, and the infiltration capacities and dissemination of water in soils determine the disposition of surface water. The Hydrological Group (National Soil Survey Interpretations Handbook, 618.03-19) is a crude gage of the role of a soil in regulating the rate of runoff. There are three classes, or groups (Table 6): A, low runoff potential; B, moderately low runoff potential; C, moderately high runoff potential; and D, high runoff potential.

The delivery of sediment to lakes and streams depends on runoff and erosion. Also, soil loss from surface erosion reduces soil quality and ecological productivity. Soil erosion is generally predicted from precipitation (erosivity), slope and topographic relief, soil erodibility, and soil cover factors. A standard index of erodibility is the K-factor (National Soil Survey Interpretations Handbook, 618.03-11): K_f for the fine earth (particles < 2 mm) and K_w for the whole soil, including rock fragments (Table 6). The soil erosion hazard rating (FSH 2509.22, form R5-2500-14) groups relative soil loss potentials into four classes: low, moderate, high, and very high. Each soil was assigned to one of these classes, assuming organic cover to be absent (Table 6).

6.2 Timbered Areas

Tree growth and basal area are indicators of forest productivity for timber. Trees were cored and heights were measured at representative sites with suitable trees. Timber site index was calculated from an equation presented in Wensel et al. (1987); an equation that has been incorporated into the California Conifer Timber Output Simulator (CACTOS). Basal area was estimated around each plot center, utilizing a 20-factor prism. Tree growth data are presented in Table 7, and the approximate site index for each timbered ET is given in Table 8.

Forest floor fuel loads (forest residue class) are indicated by codes, and each class is represented by a photograph in a guide to the codes (Blonski and Schramel, 1981). Classification of forested sites was accomplished by comparing each site to pictures in the guide to find the closest match. The forest residue codes for all timbered ETs are listed in Table 7.

Table 6. Hydrologic group, surface soil erodibility, and erosion hazard rating.

| Ecological Type | Slope Gradient | AWC ^a | Hydro. Group ^b | Erodibility | | Erosion Hazard rating |
|-----------------|----------------|------------------|---------------------------|-------------|------|-----------------------|
| | | | | Kf | Kw | |
| 321-1 | 1-6 | 3-6 | C | 0.32 | 0.20 | VH |
| -2 | 2-9 | 8-16 | B | 0.30 | 0.26 | H |
| -3 | 2-12 | 16-18 | B | 0.22 | 0.20 | H |
| 322-1 | 2-12 | 16-18 | B | 0.22 | 0.20 | H |
| -2 | 2-9 | 8-16 | B | 0.30 | 0.26 | H |
| -3 | 1-6 | 3-6 | C | 0.32 | 0.20 | VH |
| 330-1 | 60-85 | 4-8 | B | 0.22 | 0.04 | VH |
| -2 | 60-85 | 1-3 | D | 0.32 | 0.12 | VH |
| -3 | 60-85 | 8-12 | B | 0.26 | 0.16 | VH |
| 331-1 | 30-60 | 7-12 | B | 0.12 | 0.08 | VH |
| -2 | 25-45 | 16-18 | B | 0.16 | 0.10 | VH |
| 332-1 | 6-25 | 16-18 | B | 0.16 | 0.10 | H |
| -2 | 15-30 | 7-12 | B | 0.12 | 0.08 | VH |
| 333-1 | 30-60 | 6-10 | Bh | 0.08 | 0.02 | VH |
| -2 | 25-60 | 10-16 | Bh | 0.08 | 0.06 | VH |
| 334-1 | 6-25 | 17-19 | Bh | 0.14 | 0.10 | H |
| -2 | 15-30 | 10-16 | BH | 0.08 | 0.06 | VH |
| 335-1 | 30-60 | 9-14 | Ah | 0.10 | 0.09 | VH |
| -2 | 25-45 | 12-16 | Ah | 0.12 | 0.10 | VH |
| 336-1 | 6-25 | 12-16 | Ah | 0.12 | 0.10 | H |
| -2 | 6-25 | 12-16 | Bh | 0.10 | 0.08 | H |
| -3 | 15-30 | 9-14 | Ah | 0.10 | 0.09 | VH |
| 337-1 | 25-45 | 5-9 | B | 0.32 | 0.20 | VH |
| -2 | 30-60 | 16-19 | B | 0.32 | 0.14 | VH |

| | | | | | | |
|-------|-------|-------|---|------|------|----------------|
| -3 | 30-60 | 2-5 | C | 0.36 | 0.20 | VH |
| 339-1 | 60-85 | 5-7 | B | 0.18 | 0.08 | VH |
| -2 | 70-85 | 1-4 | D | 0.18 | 0.06 | VH |
| -3 | 70-85 | < 1 | A | nil | nil | L |
| 351-1 | 30-60 | 2-5 | D | 0.36 | 0.20 | VH |
| -2 | 25-45 | 5-9 | B | 0.32 | 0.20 | VH |
| -3 | 30-60 | 16-19 | B | 0.32 | 0.14 | VH |
| -4 | 25-45 | 8-13 | B | 0.32 | 0.25 | VH |
| 352-1 | 3-30 | 5-9 | B | 0.32 | 0.20 | VH |
| -2 | 6-30 | 8-13 | B | 0.32 | 0.25 | VH |
| -3 | 3-25 | 8-17 | D | 0.36 | 0.36 | H |
| 353-1 | 30-60 | 8-10 | B | 0.24 | 0.12 | VH |
| -2 | 25-60 | 9-18 | B | 0.34 | 0.30 | VH |
| -3 | 25-60 | 6-8 | B | 0.18 | 0.16 | VH |
| 354-1 | 3-30 | 8-10 | B | 0.24 | 0.12 | H |
| -2 | 3-30 | 9-18 | B | 0.34 | 0.30 | VH |
| -3 | 3-30 | 11-20 | B | 0.26 | 0.14 | VH |
| 360-1 | 1-3 | 6-10 | B | 0.16 | 0.06 | L |
| -2 | 1-3 | 9-14 | B | 0.24 | 0.12 | M |
| 361 | 1-6 | 6-12 | B | 0.27 | 0.18 | H |
| 362 | 0-3 | 20-22 | B | 0.16 | 0.15 | M |
| 363 | 0-1 | 21-24 | D | - | - | L ^d |

^a Plant available water holding capacity, or 0.1 to 1.5 MPa water retention difference, in 1 m of soil or to bedrock < 1 m deep. The broad ranges are mainly because of depth ranges.

^b Lower case h indicates highly hydrophobic soils that are at least one class lower when rain falls on dry soil.

^c EHR ranges are mainly because of slope gradient ranges. H = high, L = low, M = moderate, VH = very high.

^d Erosion hazard rated low with O-horizon, moderately high without O-horizon.

Table 7. Tree growth data and natural forest residue at representative ET sites.

| Site | ET | Species | Cored Tree | | | Forest SI ^a | Residue ^b Code |
|------|-------|---------|------------|--------------------|--------|---------------------------|------------------------------|
| | | | DBH | Age | Height | | |
| | | | inches | years | feet | feet | |
| RC01 | 335-1 | WF | 20 | 56 | 90 | 82 | 1-WF-4 |
| | | WF | 20 | 41 | 86 | 109 | |
| RC03 | 336-1 | WF | 25 | 51 | 112 | 116 | 2-WF-4 |
| | | WF | 27 | 53 | 113 | 113 | |
| RC04 | 322-1 | PP | 13 | 56 | 67 | 58 | 3-PP-3 |
| | | PP | 17 | 64 | 61 | 46 | |
| | | PP | 14 | 58 | 66 | 55 | |
| RC05 | 331-1 | PP | 17 | 85 | 88 | 57 | 2-MP-4 |
| | | PP | 19 | 93 | 74 | 44 | |
| | | PP | 12 | 62 | 53 | 39 | |
| RC06 | 332-1 | PP | 17 | 93 | 104 | 66 | 3-MP-4 |
| | | PP | 23 | 102 | 127 | 80 | |
| RC08 | 334-1 | WF | 14 | 58 | 68 | 57 | 3-MF-4 |
| | | WF | 19 | 66 | 92 | 73 | |
| | | WF | 13 | 52 | 70 | 66 | |
| RC14 | 354-1 | PP | 13 | 85 | 85 | 55 | 2-MP-3 |
| | | DF | 16 | 57 | 108 | 100 | |
| | | DF | 14 | 64 | 75 | 58 | |
| RC15 | 354-3 | DF | 10 | 49 | 48 | 44 | 2-MP-3 |
| | | DF | 23 | 68 | 102 | 80 | |
| RC16 | 353-2 | PP | 20 | 114 | 94 | 53 | 2-MP-4 |
| | | SP | 10 | 56 | 58 | 48 | |
| RC20 | 333-1 | PP | 64 | (300) ^d | 202 | (114) | 3-MF-4 |

| | | | | | | | |
|------|------------------|----|----|-----|-----|-----|--------|
| | | DF | 20 | 81 | 105 | 73 | |
| RC21 | 353-3 | PP | 20 | 126 | 96 | 53 | 3-MP-4 |
| | | DF | 17 | 69 | 85 | 64 | |
| | | DF | 14 | 69 | 81 | 60 | |
| RC22 | 333 ^c | WF | 8 | 53 | 44 | 36 | 2-MP-3 |
| | | WF | 13 | 77 | 61 | 39 | |
| RC23 | 333-2 | WF | 9 | 66 | 50 | 35 | 2-MF-4 |
| | | WF | 30 | 117 | 125 | 74 | |
| RC24 | 336-2 | WF | 21 | 58 | 118 | 109 | 1-MF-4 |
| | | WF | 21 | 59 | 105 | 94 | |
| RC25 | 331-1 | DF | 14 | 49 | 72 | 72 | 2-MP-3 |
| | | DF | 8 | 39 | 48 | 57 | |
| RC27 | 339-1 | DF | 14 | 75 | 81 | 56 | 2-MP-4 |
| | | DF | 19 | 79 | 96 | 67 | |

^a Timber site index, or height above breast-height, for a breast-height age of 50 years (Wensel et al., 1987). A 300 year age was assumed to compute values in parenthesis. ^b Blonski and Schramel, 1981. ^c ET inclusion, not a major ET. ^d Assumed age of an old, uncored tree.

Table 8. Timber site index^a for each Ecological Type.

| EMU | ET within EMU ^b | | |
|-----|----------------------------|-----|----|
| | 1 | 2 | 3 |
| 321 | - | - | 50 |
| 322 | 50 | - | - |
| 330 | - | - | - |
| 331 | 60 | 70 | - |
| 332 | 70 | 60 | |
| 333 | 70 | 80 | |
| 334 | 70 | 80 | |
| 335 | 90 | 115 | |
| 336 | 115 | 100 | 90 |
| 337 | - | - | - |
| 339 | 60 | - | - |
| 351 | - | - | - |
| 352 | - | - | - |
| 353 | 60 | 50 | 60 |
| 354 | 60 | 50 | 60 |
| 360 | nd | nd | - |
| 361 | nd | | |
| 362 | nd | | |

^a Timber site index based on tree height above breast height for a breast-height age of 50 years (Wensel et al., 1987).

^b Nontimber ETs are indicated by dashed line (-); and nd = not determined, or no data.

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Map of Geocological Units.

