

LAND SYSTEM INVENTORY

FIRST REVIEW DRAFT



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CLEARWATER NATIONAL FOREST

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Introduction to the Survey Area

The Clearwater National Forest is located in north central Idaho (see vicinity map) and spans from just east of the Washington-Idaho border to the Bitterroot Divide separating Montana and Idaho. The Forest includes the North and Middle Forks of the Clearwater River as well as the Lochsa and Palouse River drainages. The Clearwater is bordered on three sides by four other National Forests; the Bitterroot, Lolo, Nezperce, and St. Joe.

A total of 1,838,730 acres of land is administered by the Clearwater National Forest. Topography includes gently rolling Palouse hills and level basalt plateaus to the west with deeply dissected mountain slopes and glaciated lands to the east in the Bitterroot Mountains. Elevations range from 1,600 feet in the east to more than 8,800 feet on the Bitterroot Divide. The climate of the Forest is dominated by Pacific maritime air masses and prevailing westerly winds. Annual precipitation ranges from 30 inches at lower elevations to over 100 inches on the Bitterroot Divide.

Timber species on the Forest include western white pine, western red cedar, ponderosa pine, western larch, Douglas-fir, grand fir, subalpine fir, western hemlock, mountain hemlock, and Engelmann spruce. The programmed timber harvest is about 160 million board feet annually for fiscal years 1981 through 1985.

The Forest provides habitat for over 350 species of wildlife, with elk being by far the most important. Other wildlife include moose, whitetail deer, mule deer, rocky mountain goats, mountain lion, black bear, as well as numerous small mammals and birds. The northern bald eagle and rocky mountain grey wolf are listed as endangered on the Forest, while the grizzly bear is a threatened species. Important fishery resources on the Forest include blue ribbon cutthroat trout streams, and larger drainages which are habitat for anadromous steelhead and chinook salmon.

Watershed systems on the Forest are part of the larger Snake River system, and have a direct effect on water recreation, sport, and commercial fisheries, water transportation, irrigation, and downstream power generating facilities. Water quantity is adequate, and water quality has historically been excellent.

Recreation on the Clearwater includes big game hunting, fishing, camping, cross-country skiing, river rafting, hiking, and wilderness trips. Recreational opportunities exist along numerous rivers and streams as well as in the 70% of the Forest which is unroaded. The Forest contains part of the Selway-Bitterroot Wilderness as well as four other areas recommended for wilderness.

Range resources on the Clearwater are somewhat limited by steep, remote terrain which is dominated by heavy timber, and by short growing seasons in higher elevations which are often difficult to gain access to. Present primary range consists of meadows interspersed in forested lands, and by temporary production of forage resulting from timber harvest or fire.

History of the Survey Area

The Clearwater National Forest and adjacent survey areas have a varied history which includes Indian wars, the Lewis and Clark expedition, gold discoveries, and the development into a large scale timber producing area.

This area was prehistorically occupied by Indian tribes primarily the Nez Perce. Other tribes from surrounding areas including the Spokanes, Coeur d'Alenes, Flatheads, and Shoshones ventured into the survey area periodically.

The first white explorers to traverse this area were Lewis and Clark on their historic journey to the west coast in 1805-1806. Fur trappers and missionaries moved into the area shortly afterward. Idaho's first gold discovery was in 1860 near Pierce. Other prospectors soon entered the area, temporarily creating a "boom town" effect. In 1877, Chief Joseph led his Nez Perce people out of this part of Idaho via the Lolo Indian Trail to Montana, with the Cavalry in pursuit. Later battles were among the last fought between the Nez Perce and the Army.

The Clearwater National Forest was formally created in 1908 by President Theodore Roosevelt. The original area included all the present Forest, as well as portions of the St. Joe and old Selway National Forest. Kooskia was then the Forest Headquarters. Over the next three decades, large forest fires burned over large areas, with some areas being ravaged several times. Some of the scars from these fires have not completely recovered today. Other significant occurrences on the Forest include the first timber sale in 1922, the establishment of the Selway-Bitterroot Wilderness in 1964, and the administrative attachment of the Palouse District in 1973.

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**CLEARWATER
NATIONAL FOREST**
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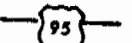


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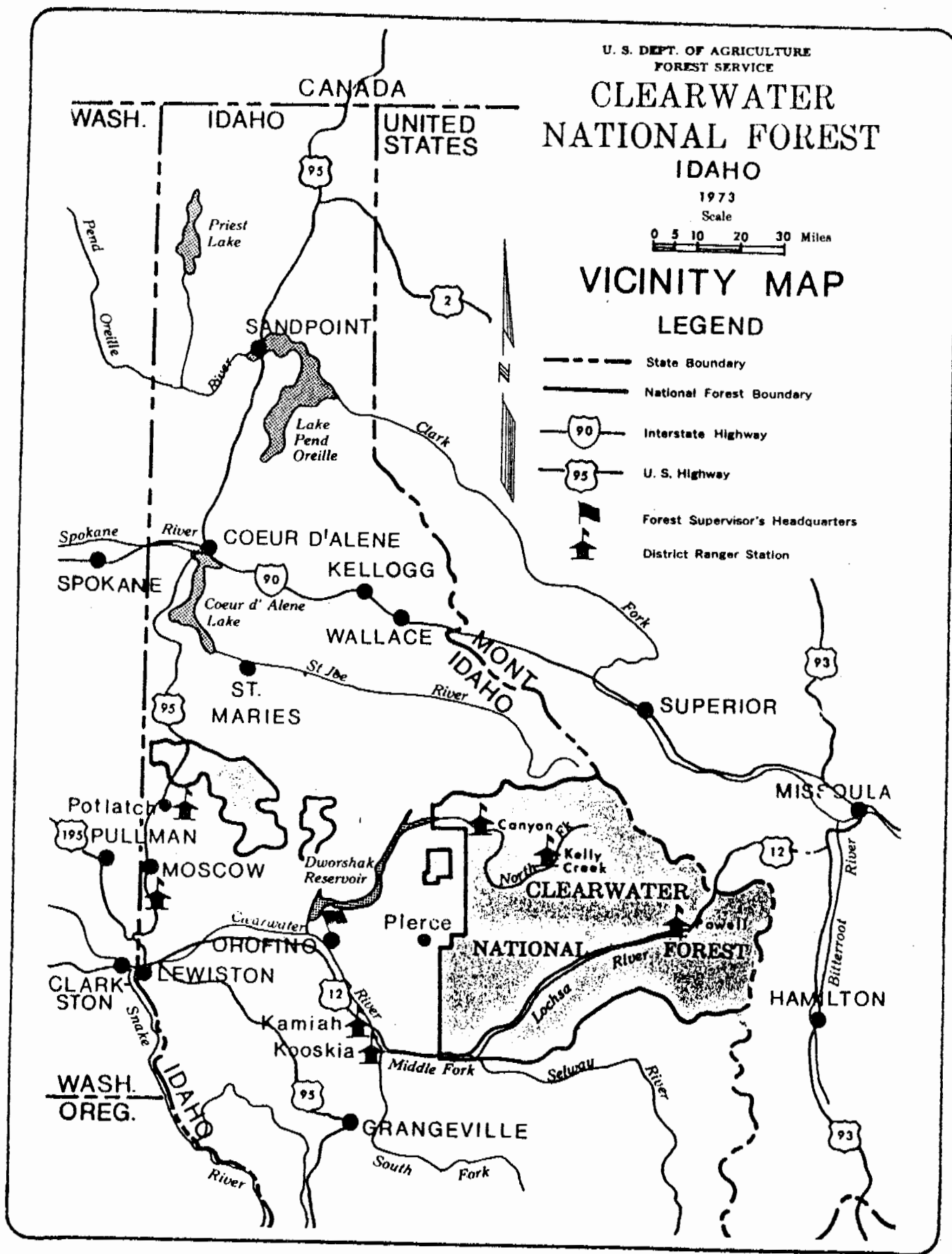
Scale

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VICINITY MAP

LEGEND

-  State Boundary
-  National Forest Boundary
-  Interstate Highway
-  U. S. Highway
-  Forest Supervisor's Headquarters
-  District Ranger Station



CLIMATE

(See Figure 1)

The climate of the Clearwater National Forest is dominated by Pacific maritime air masses and prevailing westerly winds. Annual precipitation varies from 30 inches at lower elevations to over 100 inches along the Bitterroot Divide. Snow accounts for 40 percent of the annual precipitation at lower elevations to 80 percent at higher elevations. Over 90 percent of annual precipitation occurs during fall, winter, and spring months as a result of cyclonic storms in the form of a series of frontal systems moving east. Powell Ranger District is an exception with less than 80 percent of the annual precipitation occurring during fall, winter, and spring months. These events typically produce long duration, low intensity precipitation.

Climate during summer months is influenced by stationary high pressure over the northwest coast.

Table 1 presents monthly distribution of precipitation from valley locations across the Forest. Temperature is variable with average annual temperatures ranging from 47°F at the lower elevations to 30°F at higher elevations. Winter low temperatures of -30°F are not unusual for short periods while summer extremes rarely exceed 100°F.

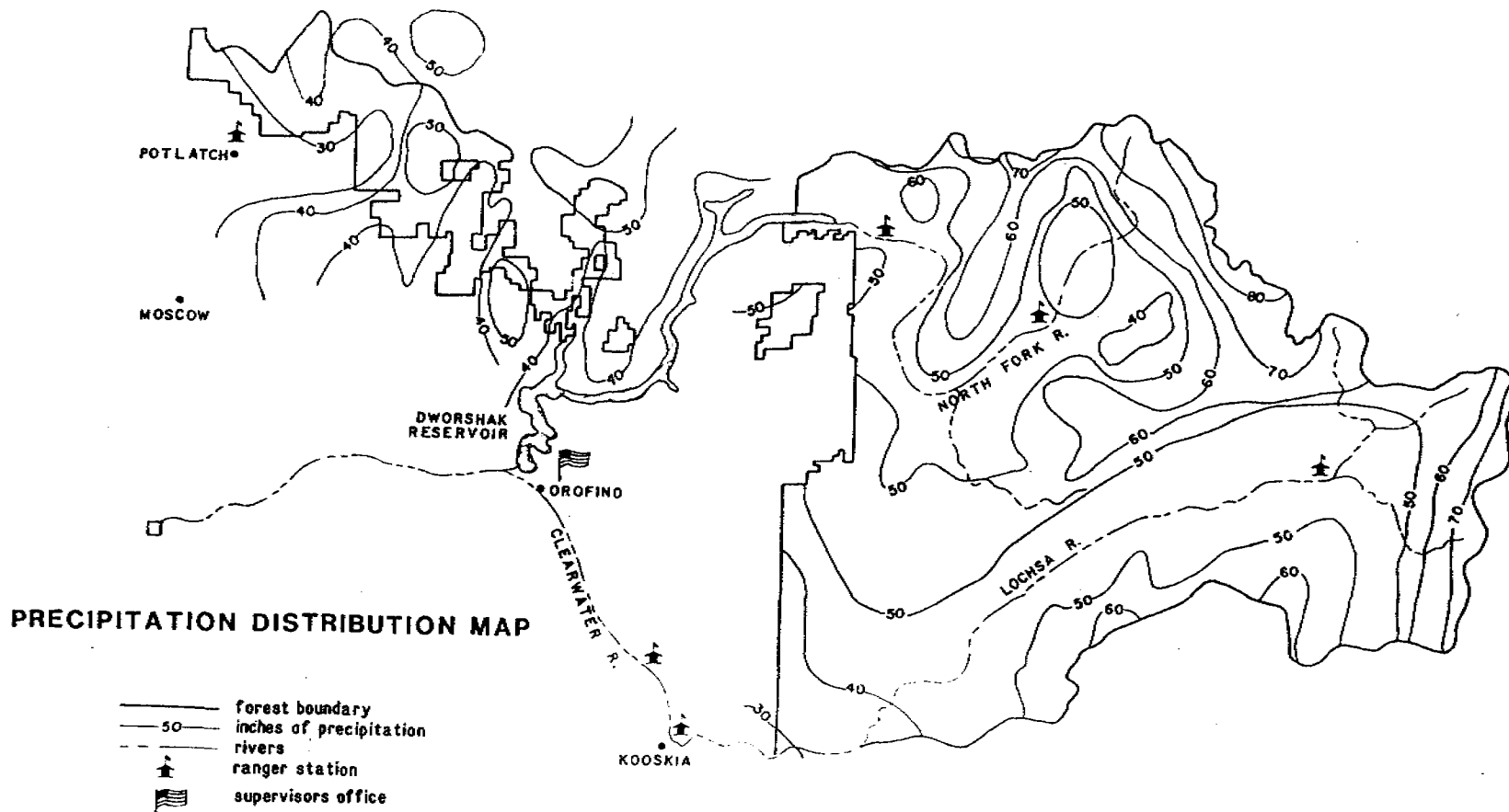
Figure 1 is a precipitation map of the Clearwater National Forest compiled from local precipitation storage gauge and runoff data.

Table 1 Monthly Precipitation - Inches

	Elev.	Annual	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Elk River	2,900 ft	41.35	5.6	4.3	4.2	4.2	2.5	2.4	.7	1.4	2.2	3.4	5.1	5.3
Pierce	3,087 ft	43.6	5.5	4.3	4.2	3.8	3.5	3.5	1.0	1.1	2.4	3.7	5.0	5.6
Headquarters	3,136 ft	39.8	6.1	3.9	3.5	3.2	2.8	2.7	1.1	1.6	1.9	2.7	4.5	5.7
Bungalow	2,249 ft	36.3	4.3	4.6	4.0	2.9	1.9	2.3	.7	.7	1.8	2.6	4.0	6.0
Powell	3,500 ft	37.9	3.8	2.5	3.0	2.5	3.2	1.5	3.6	2.6	1.5	2.3	4.1	7.3



Figure 1



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General Geologic History

(See Figure 2)

The geologic record begins about 2.5 billion years ago with a sea covering north Idaho. The Forest is at the mouth of a large bay extending east to somewhere around Helena, Montana. Silt, clay and fine sand were brought to the bay and laid down as siltstones, shales, and dirty sandstones. These became the lower Belt rocks, the Pritchard, Burke, Revett, St. Regis, and Wallace formations. The only living things were in the oceans and were the most primitive of blue-green algae.

The Forest stayed submerged under seawater until about 300 million years ago, just before the age of dinosaurs. Then tectonic rise resulting from plate collision and volcanic activity centered around the Seven Devils area, caused it to rise above sea level. During this interval, sediments continued to deposit over the Belt rocks. Very old metamorphism and a number of deformations preserved in the Belt rocks imply the area was above sea level and subject to erosion at another time in the past, but no direct record survives. The continuing volcanic activity prestaged the rise of the Idaho Batholith. This great body of granitic rock rose from below in late Cretaceous time, about 150 million years ago. Its rise pushed everything above it, including the overlying Belt rocks, up. This was a time of much faulting and mountain building and was the time the Belt rocks were deformed and highly metamorphosed to gneisses and schist. A little later, the central part of the batholith was implaced in the early tertiary period, about 60 million years ago. This rising pluton intruded and metamorphosed both the belt rocks and the older granitics, converting some older granitics in gniess and grussic granite. Hydrothermal alteration subjected areas of the existing gniess, schists, and granites to intense chemical attack and alteration to clay minerals. Erosion striped off all the overlying rocks down to the lower Belt rocks, and exposed the Border Zone and the newly formed batholith.

A Brief Geomorphc History of the Clearwater National Forest

The oldest class of landforms left are those developed from the Eocene, 58 million years ago, to Miocene times about 25 million years ago. This is a low elevation, low relief, highly dissected landscape with accordant ridges and low stream gradients. The climate was subtropical, for most of this period with slight subaerial erosion and intense chemical weathering being the dominant processes. The underlying granitics, gniesses, and schists were intensely chemically weathered to great depths. Lateritic soils were also created.

During Miocene times, 25 million years ago, the low ground was flooded by basalt flows which dammed the drainages and raising base levels to that of the top of the lava flows. The landscape at this point consisted of flat topped lava plateaus with a few of the old surface remnants protruding the basalt on the western portion of the plateau. East of the plateau, the low relief old surfaces gradually changed to broad convex ridges as elevation increased toward the Bitterroot Divide. The climate was warm, moist, and temperate supporting oak, beech, redwood, avocado and swamp cypress. Streams flooded over the top of the basalt floors creating a low relief alluvial landscape. Streams were filled and graded to a level even with the top of the basalt plateaus.

The climate continued to cool from 13 million to about 1 million years ago to a level probably slightly warmer than the present time. During this time a gradual uplift in the east and gentle tilting to the west covered what has been estimated at about 4,000' of rise in elevation. This greatly increased stream gradients. This resulted in the streams rapidly cutting through the basalt and into the crystalline rocks below, drastically lowering the base level. The resulting landscape is characterized by steep high relief landforms with oversteepened and unstable slopes of the river canyons.

Continuing cooling in conjunction with elevational cooling from the uplift brought mountain glaciation to higher areas on the Forest. There is no record of glaciation earlier than Bull Lake Age (75,000 years B.P. or early in the Wisconsin glaciation.) The other three great ice ages apparently occurred on the Forest. Most portions of the Forest above 5,500 feet show signs of multiple mountain glaciations along with strong frost churning.

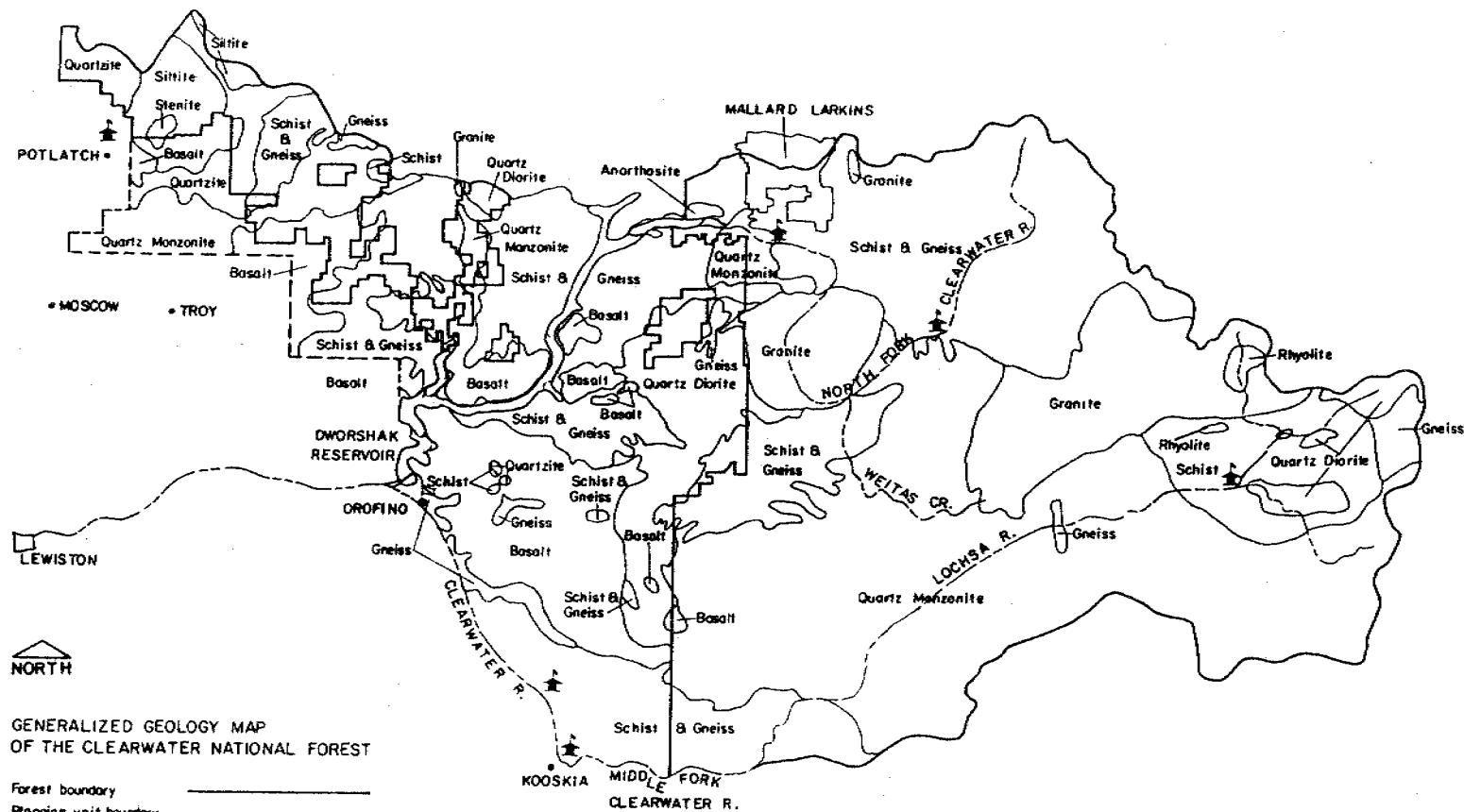
During this period, several ash falls occurred beginning about 12,000 years ago and ended about 6,600 years ago, with the exception of several light dustings such as the 1980 St. Helens ash fall.

Since the end of the glaciation, fluvial erosion and mass wasting are the chief land forming processes. Portions of the old surface remain as relics between major canyons where they have not yet been destroyed by the rejuvenation resulting from uplift and downcutting of streams.



FIGURE 2

Generalized Geology Map



NORTH

GENERALIZED GEOLOGY MAP
OF THE CLEARWATER NATIONAL FOREST

- Forest boundary
- Planning unit boundary
- Geologic boundaries
- Rivers
- Ranger station ★

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LANDTYPE ASSOCIATION UNITS

(See Figure 3)

1 - Rolling Foothills

This landtype association consists of low relief rolling foothills ranging from 3,000 to 5,200 feet in elevation. Slope gradients are generally less than 40%. Landscapes are characterized by well developed dendritic drainage systems.

Soils are developed from well weathered igneous and metamorphic rocks. Soils usually have a volcanic ash surface overlying deep, weakly developed, nonskeletal subsoils. Bedrock weathering often exceeds 10 feet in depth. Soil characteristics are not strongly influenced by aspect. Andepts and Andic Dystrichrepts are the dominant soils.

Western red cedar/pachistima habitat types occupy most of the landtype association. Grand fir/pachistima and subalpine fir/pachistima occur in the higher elevation margins. Grand fir/pachistima also occurs in the low precipitation zones along the western edge of the Palouse District. Western hemlock/pachistima occurs on north aspect and moist draws of the Palouse District.

This landtype association is highly productive and intensely managed for timber production. It has few silvicultural limitations and is relatively stable with road prism erosion being the major watershed problem.

2 - Basalt Plateaus and Rolling Hills

This landtype association consists of low relief plateaus and rolling hills ranging from 2,000 to 3,600 feet in elevation. Slope gradients are generally less than 30%. Landscapes are characterized by well developed dendritic drainage systems.

This unit occurs along the eastern edge of the Columbia River basalt flow. The basalt is overlain by ancient alluvium and Palouse loess of varying thickness. Soils are silty textured with a thick ash cap and are well developed. The dominant soils are Glossoboralfs.

Western red cedar/pachistima is the dominant habitat type.

These are the most productive lands and have few silvicultural limitations. Roading limitations include rutting, and subsequent erosion during wet periods.

3 - Palouse Steppes

This unit comprises the eastern edge of the Palouse Prairie. It consists of low relief rolling aeolian (wind deposited) hills.

Parent material is wind deposited loess ranging up to several hundred feet thick. Soils are well developed, silty in texture, and classified as Xerolls, Borolls, and Boralfs.

Most of the unit is now cultivated, but was originally grassland with Douglas-fir and ponderosa pine on north aspects and in draws.

4 - Colluvial and Frost Churned Mountain Slopes

This landtype association occupies mid and upper slopes of major ridge systems. Elevations range from 2,000 to over 6,000 feet. Slopes are steep, dissected, and straight to slightly convex in shape at lower elevations. Slopes become broad and rounded with few stream dissections at higher elevations. Localized glaciation occurs on north and east aspects of high ridges and peaks.

Bedrock is moderately weathered at lower elevations and weakly weathered at higher elevations. Soils are moderately deep to deep and are usually covered with an ash cap. Soils are colluvial or frost churned in nature and weakly developed. Coarse fragment content increases with elevation and reaches 75% on higher ridges. Typic Vitrandepts and Andic Dystrichrepts occur at lower elevations. Cryandepts, Andic Cryochrepts, and Cryumbrepts dominate higher elevations.

Western red cedar/pachistima and grand fir/pachistima habitat types occupy lower elevations with grand fir/pachistima being confined to drier southerly aspects. Subalpine fir habitat types occupy the higher elevations. Subalpine fir/beargrass occurs on drier southerly slopes and ridgetops. Subalpine fir/pachistima and menziesia occurs on northerly aspects and moister southerly aspects.

This unit covers a broad range of management potentials. Productivity is moderate to high at the lower elevations depending on aspect and low to moderate at higher elevations. Silvicultural limitations and opportunities are wide ranging due to the variation in soils, climate, and vegetation.

Lower slopes are moderately stable with localized zones of mass instability. Stability increases with elevation, with the broad rounded upper ridges being among the most stable lands on the Forest.

5 - Palouse Mountains

This unit consists of steep moderate relief ridge systems on the Palouse District. Slopes are straight, dissected, and have 40 to 60% gradients. Elevations range from 3,000 to 5,500 feet, but are mostly under 4,000 feet.

Bedrock is moderately weathered Belt rock. Soils are moderately to weakly developed, well drained, and have thick ash caps. Soils are classified as Andepts and Glossoboralfs.

This is a very productive unit with few silvicultural limitations and only local stability problems.

Western red cedar and western hemlock habitat types dominate the unit.

6 - Breaklands

This landtype association consists of steep slopes adjacent to rivers and their tributaries. The slopes are oversteepened as a result of streams downcutting faster than the adjoining slopes could retreat. Elevation varies from 1,600 to 6,000 feet and relief of several thousand feet is common. Slopes are long and straight to concave in shape. Gradients exceed 60%.

Bedrock is moderately to weakly weathered. Rock outcrop is common. Soils are colluvial, weakly developed, and vary widely in properties. Soils on northerly aspects tend to be deep and skeletal with a mixed ash cap. On southerly slopes, soil depths vary from deep to less than 20 inches in depth. Ash caps are thin or missing on shallow soils and are mixed on others. Andepts and Andic Dystrachrepts occur on northerly aspects with Andic Dystrachrepts, Typic Dystrachrepts, Xerochrepts, and Xerorthents occurring on southerly slopes.

Western red cedar/pachistima habitat type occurs on northerly aspects, in draws, and on moist deep soils on southerly aspects. Grand fir/pachistima occurs on the drier moderately deep soils with Douglas-fir habitat types on shallow (<20-inch) soils.

These lands are the most unstable on the Forest. Stability and the high cost of access, limits management potential. Productivity varies from high on the northerly aspects to low or noncommercial for shallow droughty soils on southerly aspects. Regeneration is a problem on southerly slopes because of droughtiness and high soil temperatures. Most of the Forest's big game winter range occurs in this unit.

7 - Glaciated Ridges, Peaks, and Cirques

This unit is characterized by cirque basins, scoured troughs, steep rocky crags, and other features of strong alpine glaciation. Elevations are over 5,500 and usually over 6,000 feet except in the bottom of deep troughs. Alpine lakes are common.

Bedrock is scoured and very weakly weathered with rock outcrop occupying a large percentage of the unit. Soils have developed in glacial tills of varying depths, but are predominantly shallow and excessively well drained.

All subalpine fir habitat types are represented with beargrass and whitebark pine being the most common. Alpine meadows are common in the cirque and trough bottoms.

Most of this unit is considered noncommercial because of poor site quality, difficult access, and high values for dispersed recreation.

8 - Ice Cap Scoured and Depositional Lands

This landtype association occurs on the southern and eastern portion of the Powell District. It consists of undulating uplands with low relief. The uplands are dissected by broad U-shaped valleys. Elevations for the uplands range between 5,000 and 6,000 feet with valley bottoms dropping to 4,000 feet. The entire area was overlain by a thick ice cap which resulted in scoured ridges and till deposition in draws and depressions.

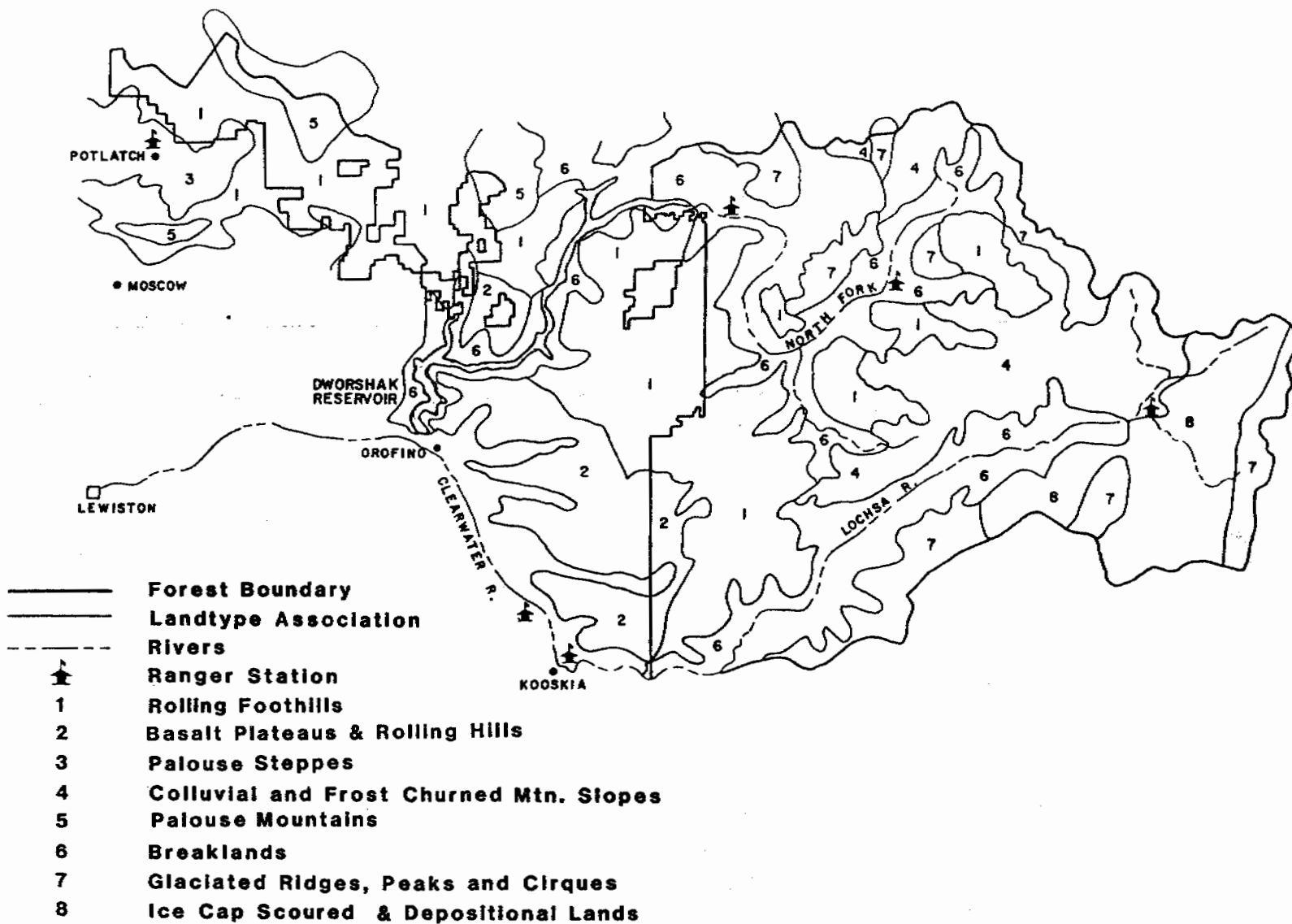
Bedrock is hard, fractured, and weakly weathered. Soils on scoured ridges have thick ash caps over moderate depth, stony, well drained subsoils. Soils in draws and depressions are deep and commonly have compacted layers within four feet of the surface. Areas with compacted soils are poorly drained and wet much of the year. Cryandepts, Andic Cryochrepts, and Cryaquepts are the dominant soil types.

Subalpine fir/menziesia habitat occupies most of the unit except the drier ridges where it is replaced by subalpine fir/beargrass. Alpine meadows are common in areas with high water tables.

Management characteristics of this unit are dominated by large amounts of spring runoff and high water tables in areas with compacted tills. Water tables can be raised to or near the surface through vegetation removal. Surface soil erosion can be severe on disturbed soils with high water tables. Well drained areas are quite stable and have few watershed problems. However, the poorly and well drained areas are intermingled over much of the unit which complicates management potential.

FIGURE 3

Landtype Association Map

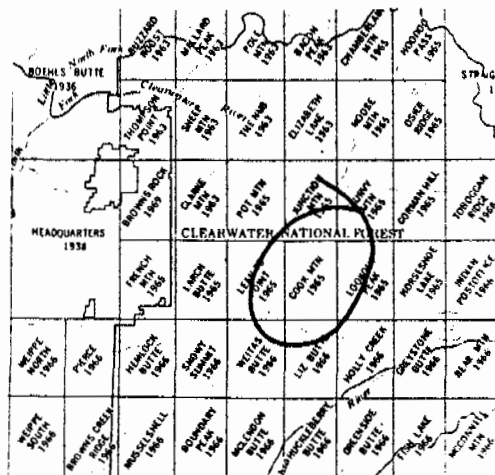


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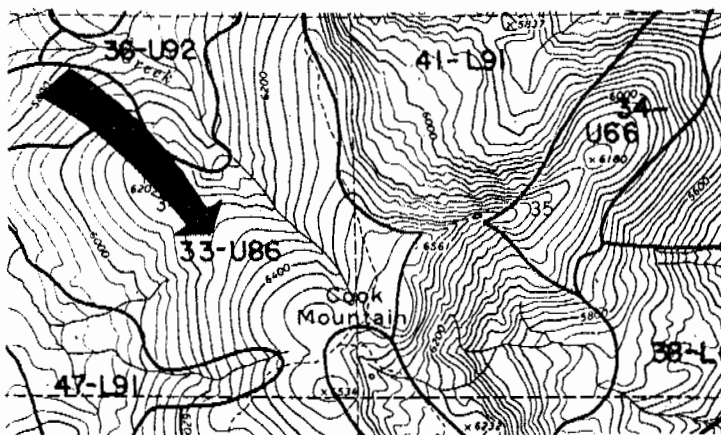
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How To Use This Landtype Inventory

1. Locate the area of interest on the index to topographic maps. Note quad name.



2. Using the topographic quad noted above, locate the area of interest.

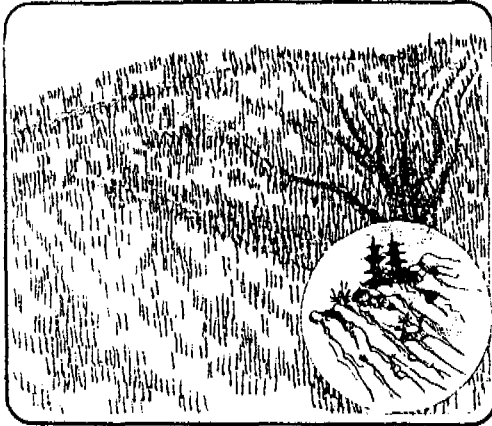


3. Determine which landtypes are of importance.
4. Look up landtype in 'Mapping Unit Legend' for general overview.

SYMBOL	LANDFORM	PARENT MATERIAL	ELEVATION	DRAINAGE	ASPECT	SOIL VEGETATION
33-U80	Broadly rounded mountain uplands	Undiffer.	Above 4,800'	Excessive	Warm	Cryochrepts, Cryandepts, ABLA/XETE
33-U86	Broadly rounded mountain uplands	Undiffer.	Above 5,500'	Excessive	Warm	Cryochrepts, Cryumbrepts, ABLA/XETE, ABLA/PIAL
33-U95	Broadly rounded mountain uplands	Undiffer.	Above 4,800'	Well & poor	All	Cryochrepts, Cryumbrepts, ABLA/PAMY, alder

5. Look up landtype in 'Landtype' section for detailed description of the mapping unit.

LANDTYPE 33-U86



SUMMARY

Number of map delineations - 37
 Total acreage - 3,300
 Average map unit acreage - 90

These units are located on high elevation, broadly rounded mountain uplands. Soils are moderately deep, excessively drained, and are developed in undifferentiated parent material. The dominant habitat type is subalpine fir/beargrass or subalpine fir/whitebark pine.

LANDFORM 33- BROADLY ROUNDED MOUNTAIN UPLANDS

Overall relief consists of broadly convex upper slopes and ridgetops of high elevation ridges. Frost churning is the major soil forming process.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 5,500 to 8,000 feet
- B. Slope Gradient - 20 to 35%
- Slope Shape - Broadly convex both vertically and laterally

6. See 'Interpretation Tables' for complete interpretations of landtype units.

LANDTYPE	SUMMER OR WINTER RANGE	FOOD	WATER	COVER	DIVERSITY	OVERALL POTENTIAL HABITAT RATING
33-086	S	M	M	H	L	M
	W	L	L	L	L	L
33-076	S	H	L	L	M	M
	W	L	L	L	L	L
33-080	S	M	L	M	M	M
	W	L	L	L	L	L
33-086	S	M	L	M	M	M
	W	L	L	L	L	L
33-095	S	H	H	H	H	H
	W	L	L	L	L	L

CLEARWATER NATIONAL FOREST LANDTYPE INVENTORY

This landtype inventory is an integrated system of land classification which includes basic information about landforms, parent material, soil, and vegetation of the Clearwater National Forest. The inventory is designed to provide the land manager with a means of evaluating the characteristics and relative potential of different lands. Such units have measured and inferred properties which can be used to predict responses to management activities, to allocate resources, and act as a guide for planning project work. Units should be field verified when used for project design.

LANDFORMS

The landform boundaries were determined through stereoscopic photo interpretation of properties such as local relief, vegetative patterns, slope shape, slope gradient, and low order stream characteristics. These boundaries were transferred to USGS (scale 1:24,000) topographic quad sheets and a landform symbol assigned.

PARENT MATERIALS

The utilitarian grouping of geologic types and parent materials having similar interpretation characteristics is made using photo interpretation and field verification.

SOILS

The soils part of the inventory is done in the field by observing characteristics such as color, texture, rock content, surface soil depth, bedrock depth, and water table occurrence. Soils are classified at the family level of the soil taxonomy as part of the National Cooperative Soil Survey.

VEGETATION

The vegetation inventory is based on the Daubenmire classification system, and is completed in the field.

THE LANDTYPE MAPS

The result of this integrated survey is the landtype map. Experience in the region has demonstrated that using photo interpretation together with field investigations produces mapping units with predictable recurring patterns of soil and vegetation.

Because this is a reconnaissance survey, all landtypes have not been examined in the field. However, most units have been viewed in the field from a vantage point. Most of the landtype units are not pure; that is, they include more than one soil, vegetative or landform type. Many units which occur together naturally in a predictable pattern are often mapped together as associations. Each mapping unit may include up to 15 percent of another contrasting mapping unit as an inclusion. Inclusions of lands with similar management properties may occupy up to 50% of the unit.

The level of reliability and the accuracy of the landtype map is considered adequate for most land use and functional planning currently being done. Because of contrasting inclusions, this level inventory should not be used for specific project implementation without an on-site investigation.

Summary of Landtype Mapping and Field Verification

The Landsystem Inventory of the Clearwater National Forest was initiated in 1971. The original inventory used mapping units which reflected landforms, landforming processes, and broad geologic classes. Soil and vegetative characteristics were loosely associated with mapping units using inferred geomorphic processes. Mapping units were designed primarily to reflect slope stability. This inventory was completed in 1974.

In 1976 it was decided to improve the 1974 inventory with more detailed soil and habitat type information. Field work was completed in 1980 and this document is a result of that revision.

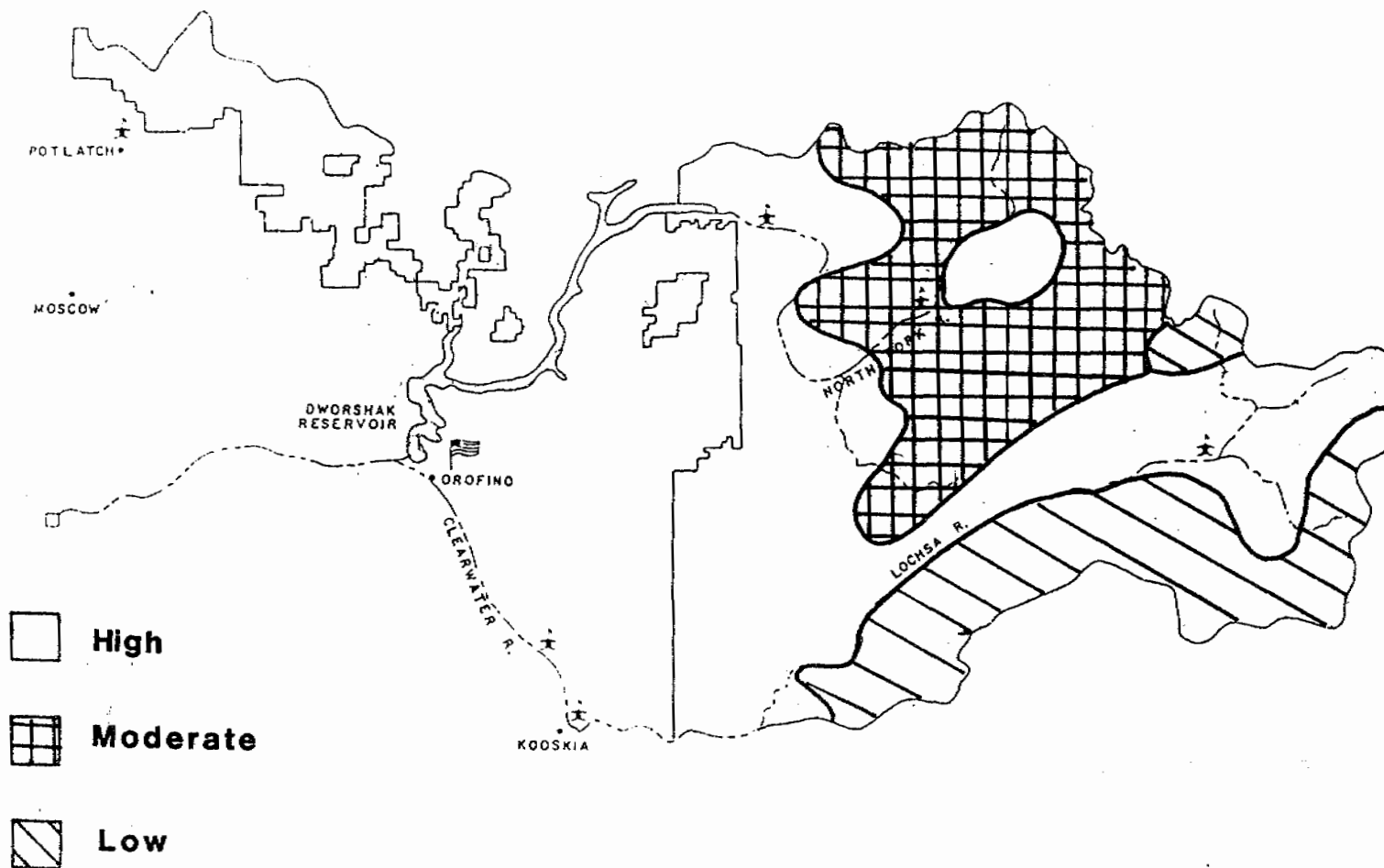
Intensity of mapping and ground verification can be divided into three categories (see Figure 4). The high intensity mapping was done in the accessible portions of the Forest with medium to high potential for management. It is estimated that two-thirds of these mapping unit delineations were verified on the ground.

Medium level intensity areas are primarily unroaded with field verification consisting of the determination of the parent material type and soil habitat type patterns associated with various landforms. Field verification consisted of walking trails and ridge systems in major watersheds.

The low level of intensity consists of aerial photograph interpretation with very limited ground verification. Soil and habitat type patterns verified in adjacent lands were extrapolated to areas with this intensity.

MAPPING INTENSITY LEVELS

FIGURE 4



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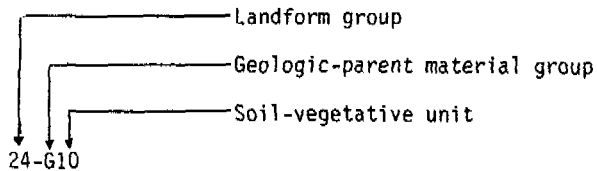
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Mapping Unit Legend Explanation

A. Mapping Unit Symbols

The landtype symbol includes three parts. These are; 1) Landform; 2) Geologic-parent material group and; 3) Soil-vegetative groups. An example of the mapping unit symbol is land-type 24-G10. The first two digit number (24) denotes the landform. Following the dash symbol, the capitol letter (G) indicates the geologic-parent material group from which the soil takes its important characteristics. After the geologic group letter is a two digit soil vegetative group number (10), which describes important soil and habitat type characteristics of the landtype.

Example:



24 - Moderate relief rolling uplands landform

G - Geologic parent material group in which decomposed granites and gneisses play important roles in soil formation and characteristic.

10 - The soil-vegetative unit which occurs on lower elevation (below 4800') cool aspect sites which are well drained and have a western red cedar/pachistima habitat type. The soil and vegetative characteristics are referred to as "modal", meaning that on these sites the most common soil has a thick volcanic ash topsoil overlying a medium textured subsoil with a total profile depth of 60 + ", and vegetation which is dominantly cedar. Major deviations from these characteristics are classified as a soil or vegetative variants.

B. Landform Group Symbols

10 Low alluvium (flood plains)	34 Steep broadly rounded mountain uplands
11 Bottomlands, meadows, old terraces	36 High elevation concave headlands
13 High terraces	38 High elevation low relief scoured uplands
15 Toe slopes, fans	41 Strongly scoured glacial cirque basins and headwalls
16 Avalanche deposits	42 Weakly scoured cirque basins, headwalls
22 Low relief rolling hills	47 Glacial trough bottoms
23 Dissected uplands	48 Nondissected glacial trough wall
24 Moderate relief rolling uplands	49 Dissected glacial trough wall
31 Mountain slopelands	50 Mass wasted slopes
32 Rounded mountain slopelands (frost churned)	60 Non-dissected stream breaklands
33 Broadly rounded mountain uplands	61 Dissected breaklands
	63 Streambreak Headlands

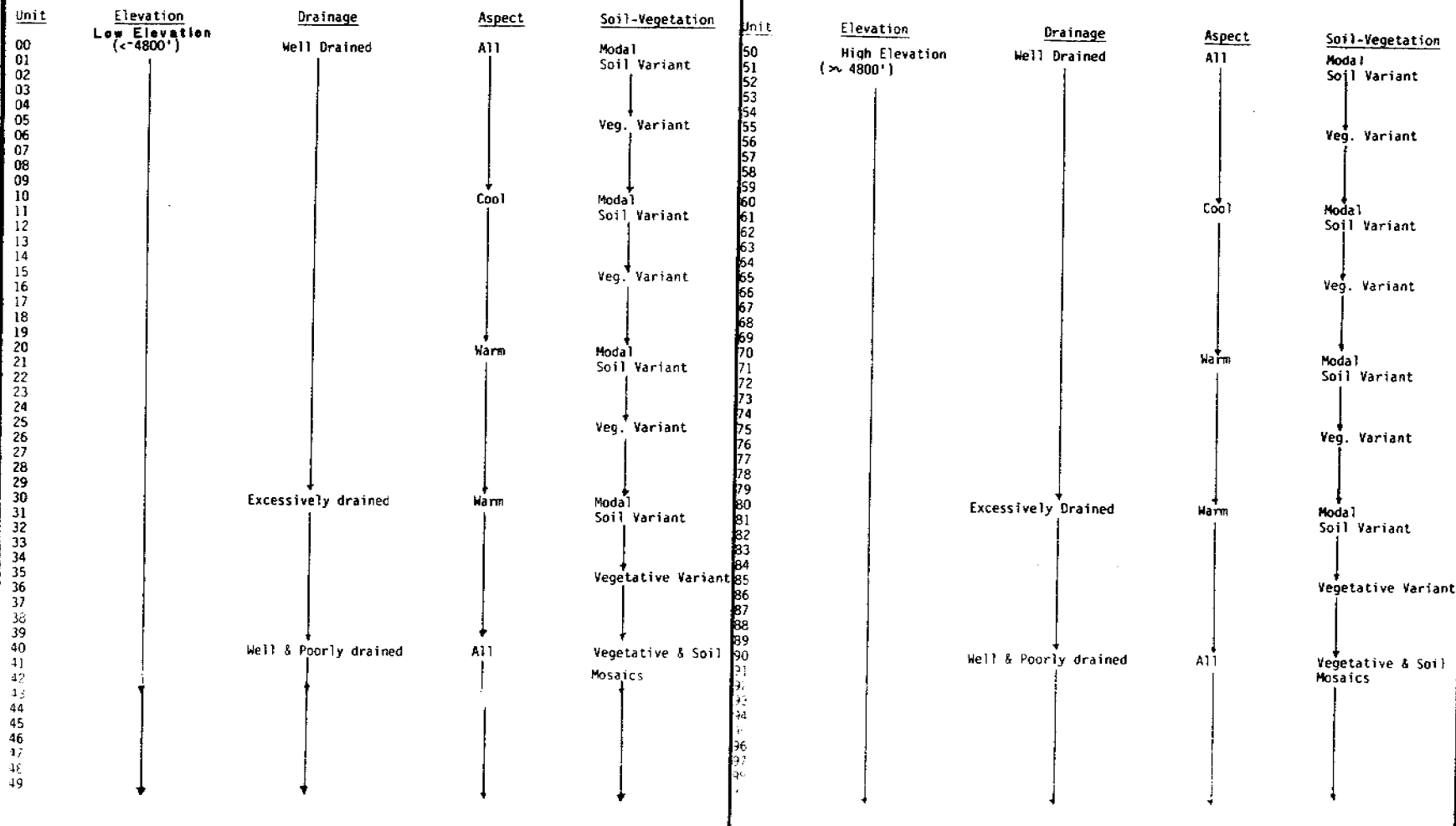
C. Geologic - Parent Material Groups

<u>Letter</u>	<u>Group</u>
A	Alluvial deposition
G	Idaho Batholith granites and gneisses (non-grussic)
K	Idaho Batholith grussic granitics
L	Glacial deposited material
Q	Belt series of quartzites, argillites and siltites
R	Revett quartzites
S	Micaceous schists, gniesses, associated Border Zone material
T	Basalt
U	Undifferentiated parent material

D. Soil Vegetation Units

This two digit number is taken from a key system which should make important characteristics easier to remember. The system contains 100 numbers, from 00 to 99. Units with low numbers (00-49) are low elevation units (less than 4800' approximately), while numbers 50-99 are high elevation types. Each elevation category is divided according to soil drainage characteristics. The first thirty numbers (00-29 and 50-79) are well drained, the next ten numbers (30-39 and 80-89) are excessively drained and the last ten (40-49 and 90-99) are poor to well drained complexes. The system also considers aspect and other soil-vegetation properties. Although there are 100 numbers included, less than half of these are used at the present time. Some numbers are left blank for future flexibility. Each number can be used with more than one geologic-parent material modifier (G10, S10, Q10). The complete list of soil-vegetative units is included on the following pages.

SOIL-VEGETATIVE UNIT NUMBERING SYSTEM



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Explanation of Mapping Unit Description Format

Summary

This block shows the total number of occurrences of the mapping unit and the acreage for the entire Forest. It briefly describes the major landform, parent material, soil and vegetative characteristics of the landtype. It is intended to enable the user to make quick distinctions between similar landtypes.

I. Landform Physical Characteristics - Listed are landform features readily identifiable and usually measurable on aerial photographs. The characteristics are used to differentiate one landform from another. The role and weight each characteristic plays in the description may vary between different landforms.

A. Elevation Range - Represents the range in elevation for the mapping unit.

B. Slope Gradient - States the normal slope range for landforms. Inclusions of small unmapped areas with slopes that fall outside the stated range are common.

C. Slope shape - is described in five classes.

- Convex both laterally and vertically.
- Convex laterally and straight vertically.
- Straight both laterally and vertically.
- Concave both laterally and vertically.
- Compound containing combinations of the above.

D. Overall Relief - A term referring to the total elevational difference in a mapped unit. This refers to range from the bottom of the unit to the top of the unit and should not be confused with dissection relief. External relief defines the dominance and size of a landform in a landscape.

E. Dissection Spacing - Describes how far apart landform dissections are in feet.

F. Dissection Relief - Describes the relief of dissections and low order streams inside the mapping units. This is used primarily to describe the hydrologic characteristics of the unit.

G. Dissection Density - Refers to the miles of dissection per square mile of mapping unit.

Slope Hydrology

Drainage pattern: The arrangement and relationship of the stream channels in a mapping unit relating to the frequency and location of branching.

Stream density: Length of all perennial stream channels of all orders per unit area expressed as miles per square mile. A portion of stream channels adjacent to the mapping unit is included (if any).

Primary stream order: The most frequently occurring stream order in terms of total length expressed as percent.

Channel type: Bed form, morphology, energy, and stability characteristics of a typical channel used to classify the stream.

Slope water movement: Water handling characteristics of the landtype primarily describing the efficiency of subsurface flow and the regulation capabilities.

Sediment delivery: Overall potential of the landtype to transfer sediment from an erosion source to the water system (the established active stream system) which may or may not occur within the mapping unit. Storage refers to the ability of the dissections and channels to store sediment.

II. Parent Material Characteristics - It should be emphasized that this is utilitarian grouping of geologic types and parent materials with similar interpretation characteristics. The following groupings are made:

A - Alluvial depositional material. This includes all recent stream terraces adjacent to major streams.

- All old terraces and bottomlands; these lands have older well developed fine textured soils with high water tables and common fragipans. Water tables and fragipans strongly influence interpretation.

- Remnants of old, high terraces and glacio-fluvial material. These commonly have silty soils with some clayey soils occurring in the Powell area.

- Soils developed from old Miocene material, associated stream deposits and blockages resulting from basalt flows. These materials occur in "old surface" topography along the western edge of the forest.

- Soils developed in wind deposited Palouse Losses. Soils are deep, silty and may contain fragipans.

G - Series Idaho Batholith granitics and associated gniesses. This grouping represents an attempt to separate the more developed, more productive Batholith soils from the sterile, "grussic" Batholith soils (K series). Soils in this class have a weakly developed sandy loam subsoil, and permeable parent materials. Soils are classed in loamy families. These soils are less erodible than the grus (K) series. These soils are less sensitive to disturbance than the K series and the subsoils are much easier to revegetate after disturbance. However, it should be realized that boundaries between G&K series are difficult to establish and mapping needs to be ground checked before project level interpretations are made.

K - Series - Grussic Idaho Batholith Granites - Soils of this series consist of thin soils over deeply weathered, coarse textured parent materials. Parent materials may be slowly permeable or impermeable and qualify as paralithic.

Subsoils in the K series are highly erodible and very difficult to revegetate. Soils are very sensitive to disturbance because of infertile subsoils. This series is mapped in the Washington Creek and Pot Mountain areas of the Canyon District, the Pot Mountain area of Kelly Creek District, Canyon Meadows, Fish Creek areas of Lochsa District and the Granite Pass area of the Powell District.

L - Series - Glacial Till - All glacial depositional material, both sorted and unsorted, are in this group. Parent materials are weakly weathered coarse textured, cobbly material.

Q - Quartzites and associated argillites and siltites of the Belt Series, exclusive of Revett quartzites - Soils derived from these materials are sandy loam textured (silt loam for siltites) and skeletal. Coarse fragments are weakly to moderately weathered. Soils derived from these materials are usually quite stable.

R - Series - Revett quartzites of the Belt Series. Soils derived from these parent materials have very fine sandy loam textures with few rock fragments. This material weathers rapidly and is extremely erosive.

S - Series - Micaceous Gniesses, shists and associated rocks of the Border Zone. Soils developed from these parent materials contain an estimated 10 to 20 percent mica and portions of the soils have weakly expressed argillic subsoils. This series is prone to mass wasting and soils have low bearing strength. This series predominately occurs adjacent to the western and northern margins of the Idaho Batholith. Included in this series is a small area of anorthosite in the Salmon Creek area of the Canyon District.

T - Basalt derived soils are limited to the Palouse District and the lower Lolo Creek areas on the Pierce District. Soils range from deep, well developed, fine textured to thin skeletal and fine textured.

U -Undifferentiated Series - Consists of mapping units where the type of parent material does not influence the interpretative criteria for the units. High elevation units where chemical weathering is weak and most interpretive criteria are influenced by mechanical weathering are included.

III. Soils Characteristics

In general, soils on the Clearwater Forest can be characterized as having a volcanic ash surface horizon over a weakly developed subsoil. These ash caps were deposited over almost the entire Forest approximately 6700 years ago. Most of the ash originated with the explosion of Mt. Mazama (Crater Lake, Oregon) and the resulting ash falls. Other ash falls have originated at Mt. St. Helens and Glacier Peak. The original deposition appears to have been between one and two feet thick. The ash has since undergone local redeposition and erosion. Ash deposits in excess of three feet in depth have been observed in depressions and protected coves scattered throughout the forest.

The ash has been eroded away or mixed with the original soil on many steep southerly aspects. The ash cap has also been eroded and mixed to varying degrees by past wildfires of high intensity. This is especially true at higher elevations where most of the erosion appears to have occurred following the intense wildfires in the earlier part of this century.

Volcanic ash which is pure has a silt loam texture. Ash caps are referred to as mixed ash when textures of sandy loam occur. Ash caps are referred to as thin when less than 7 inches in depth, medium 7 to 14 inches in depth, and thick when greater than 14 inches deep.

Ash cap characteristics are influenced by the type of vegetation which occupies a particular site. Low elevation ash cap soils supporting conifer vegetation tend to have a uniform dark yellowish brown color (11 YR 4/4).

Ash surfaced soils having vegetation dominated by shrubs, grasses and forbs are darker colored (10 YR 3/3 or 3/2) and are higher in organic matter. Such soils are referred to as umbric. Terms used in soil descriptions are taken from Soil Survey Manual USDA Handbook No. 18. Two soil descriptions are given if the mapping unit contains two contrasting soils.

General - This section gives a brief overview of soils. Characteristics mentioned are the most important soil or vegetative criteria used in the differentiation of the mapping unit.

Surface Soils - Describes the surface soils (top 24 inches or less) and gives the ranges for characteristics for the mapping unit. If an ash cap is present the description refers to the ash cap. Characteristics listed include depths and depth range, color, texture, structure moist consistence and plasticity and coarse fragments content if greater than 10%. If ash caps are not present the surface soil description refers to soils above the substratum.

Subsoils - Describes soils occurring below the ash cap and above the substratum. The description includes thickness, color, texture structure, moist consistence and plasticity, and rock fragments content.

Substratum - Descriptions vary to best describe the material. Unconsolidated material descriptions include depth, color, texture, structure, and rock fragment content.

Soil Classification - Lists the standard taxonomic classification for the most common soils occurring in the unit in order of descending occurrence. Classifications are in accordance with Soil Taxonomy, USDA Agriculture Handbook No. 436.

Soil Distribution, Variation, and Inclusions -- This describes the distribution of various soils over the mapped landform or the variations of soils over the landscape. Inclusions or random variations of described soils are listed.

Vegetation Characteristics - Describes the distribution of habitat types and other plant associations over the mapped landscape. Habitat type distribution data collected for the 1975 Timber Management Plan was used as a base. This data included elevation, aspect and slope shape and was modified with other soil and landform information. There was no attempt to distinguish between subalpine fir and Mountain hemlock habitat types. Only the subalpine fir habitat type series is used.

IV. Management Considerations

Landtype interpretations which may be considered in management decision are included in this section, and are divided into the areas of watershed, engineering, silviculture and potential wildlife habitat. Generally, concerns in these areas are mentioned if they are rated higher than a moderate potential hazard rating to serve as a flag to indicate further investigation. These management considerations are developed from the interpretations tables, and more information is available in that section as to how the ratings are made.

SYMBOL	LANDFORM	PARENT MATERIAL	ELEVATION	DRAINAGE	ASPECT	SOIL VEGETATION
10-A40	Flood plains, terraces	Alluvium	Below 4,200'	Well & poor	All	Fluvents, Aquepts, Ochrepts, Aquepts, THPL/PAMY, riparian
10-A90	Flood plains, terraces	Alluvium	Above 4,000'	Well & poor	All	Cryofluvents, Cryaquepts, ABLA/PAMY, riparian
11-A40	Bottomlands	Alluvium	2,600 to 4,800'	Well & poor	All	Ochraqualfs, THPL/PAMY, THSE/PAMY
11-A47	Meadows, bottomlands	Alluvium	Below 4,800'	Well & poor	All	Glossoboralfs, Fragiboralfs, riparian
11-A97	Meadows, bottomlands	Alluvium	Above 4,800'	Well & poor	All	Cryaquepts, Cryumbrepts, riparian
13-A00	High terraces	Alluvium	Below 4,800'	Well	All	Glossoboralfs, Dystrochrepts, THPL/PAMY
15-U00	Colluvial toeslopes, fans	Undiffer.	Above 4,800'	Well	All	Vitrandrepts, Dystrochrepts, THPL/PAMY
16-U96	Avalanche deposits	Undiffer.	3,000 to 6,000'	Well & poor	All	Ochrepts, Andepts, shrubs, forbs
22-A00	Low relief hills	Alluvium	Below 3,600'	Well	All	Fragiboralfs, Paleboralfs, THPL/PAMY
22-A01	Low relief hills	Alluvium	Below 4,800'	Well	All	Glossoboralfs, THPL/PAMY
22-A02	Low relief hills	Alluvium	Below 3,600'	Well	All	Fragiboralfs, THPL/PAMY
22-A03	Low relief hills	Alluvium	Below 4,000'	Well	All	Fragiboralfs, Paleboralfs, THPL/PAMY
22-A06	Low relief hills	Alluvium	Below 3,600'	Well	All	Fragiboralfs, Paleboralfs, ABGR/PAMY
22-A07	Low relief hills	Alluvium	Below 4,000'	Well	All	Fragiboralfs, Paleboralfs, ABGR/PAMY
22-G00	Low relief hills	Granitics	Below 4,800'	Well	All	Vitrandrepts, THPL/PAMY
22-G01	Low relief hills	Granitics	Below 4,000'	Well	All	Vitrandrepts, Paleboralfs, THPL/PAMY
22-G45	Low relief hills	Granitics	Below 4,800'	Well & poor	All	Vitrandrepts, Haplumbrepts, THPL/PAMY, alder
22-G95	Low relief hills	Granitics	Above 4,800'	Well & poor	All	Cryandrepts, Cryumbrepts, ABLA/PAMY, alder
22-K00	Low relief hills	Gruss. granitics	Below 4,800'	Well	All	Vitrandrepts, THPL/PAMY
22-K45	Low relief hills	Gruss. granitics	Below 5,200'	Well & poor	All	Vitrandrepts, Haplumbrepts, THPL/PAMY, alder
22-Q00	Low relief hills	Quartzites	Below 4,900'	Well	All	Vitrandrepts, THPL/PAMY
22-Q01	Low relief hills	Quartzites	Below 4,000'	Well	All	Vitrandrepts, Paleboralfs, THPL/PAMY
22-S00	Low relief hills	Mica schist	Below 4,800'	Well	All	Glossoboralfs, Vitrandrepts, THPL/PAMY
22-S01	Low relief hills	Mica schist	Below 4,200'	Well	All	Vitrandrepts, THPL/PAMY
22-S45	Low relief hills	Mica schist	Below 4,800'	Well & poor	All	Glossoboralfs, Haplumbrepts, THPL/PAMY, alder
22-T01	Low relief hills	Basalts	Below 3,600'	Well	All	Dystrochrepts, THPL/PAMY
22-U25	Low relief hills	Undiffer.	Below 4,000'	Well	Warm	Haploxerafs, ABGR/PAMY
23-G20	Dissected uplands	Granitics	Below 4,800'	Well	Warm	Vitrandrepts, Dystrochrepts, THPL/PAMY
23-K20	Dissected uplands	Gruss. granitics	Below 4,800'	Well	Warm	Dystrochrepts, THPL/PAMY
23-S20	Dissected uplands	Mica schist	Below 4,800'	Well	Warm	Glossoboralfs, Dystrochrepts, THPL/PAMY
24-A01	Moderate relief uplands	Alluvium	Below 4,800'	Well	All	Glossoboralfs, THPL/PAMY
24-G10	Moderate relief uplands	Granitics	Below 4,800'	Well	Cool	Vitrandrepts, Dystrochrepts, THPL/PAMY
24-G20	Moderate relief uplands	Granitics	Below 4,800'	Well	Warm	Vitrandrepts, Dystrochrepts, THPL/PAMY
24-G45	Moderate relief uplands	Granitics	Below 4,800'	Well & poor	All	Vitrandrepts, Haplumbrepts, THPL/PAMY, alder
24-G95	Moderate relief uplands	Granitics	Above 4,800'	Well & poor	All	Cryandrepts, Cryumbrepts, ABLA/PAMY, alder
24-K10	Moderate relief uplands	Gruss. granitics	Below 4,800'	Well	Cool	Vitrandrepts, Dystrochrepts, THPL/PAMY
24-K20	Moderate relief uplands	Gruss. granitics	Below 4,800'	Well	Warm	Dystrochrepts, Vitrandrepts, THPL/PAMY
24-K45	Moderate relief uplands	Gruss. granitics	Below 4,800'	Well & poor	All	Vitrandrepts, Haplumbrepts, THPL/PAMY, alder
24-Q10	Moderate relief uplands	Quartzites	Below 4,800'	Well	Cool	Vitrandrepts, Dystrochrepts, THPL/PAMY
24-Q20	Moderate relief uplands	Quartzites	Below 4,800'	Well	Warm	Eutrochrepts, Dystrochrepts, THPL/PAMY
24-Q25	Moderate relief uplands	Quartzites	Below 4,800'	Some. Exc.	Warm	Xerochrepts, Haploxerafs, ABGR/PAMY
24-Q45	Moderate relief uplands	Quartzites	Below 4,800'	Well & poor	All	Vitrandrepts, Haplumbrepts, THPL/PAMY, alder

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SYMBOL	LANDFORM	PARENT MATERIAL	ELEVATION	DRAINAGE	ASPECT	SOIL VEGETATION
24-R00	Moderate relief uplands	Revett quartzite	Below 4,800'	Well	All	Vitrandepts, Dystrochrepts, THPL/PAMY
24-R45	Moderate relief uplands	Revett quartzite	Below 5,500'	Well & poor	All	Vitrandepts, Haplumbrepts, THPL/PAMY, alder
24-S10	Moderate relief uplands	Mica schist	Below 4,800'	Well	Cool	Glossoboralfs, Dystrochrepts, THPL/PAMY
24-S20	Moderate relief uplands	Mica schist	Below 4,800'	Well	Warm	Vitrandepts, Dystrochrepts, THPL/PAMY
24-S25	Moderate relief uplands	Mica schist	3,000 to 4,000'	Some Exc.	Warm	Xerochrepts, ABGR/PAMY
24-S45	Moderate relief uplands	Mica schist	Below 4,800'	Well & poor	All	Glossoboralfs, Haplumbrepts, THPL/PAMY, alder
24-T01	Moderate relief uplands	Basalts	Below 3,600'	Well	All	Glossoboralfs, THPL/PAMY
24-T11	Moderate relief uplands	Basalts	Below 3,600'	Well	Cool	Paleborafls, THPL/PAMY
24-T21	Moderate relief uplands	Basalts	Below 3,600'	Well	Warm	Paleborafls, Glossoboralfs, THPL/PAMY
24-T25	Moderate relief uplands	Basalts	Below 3,600'	Well	Warm	Paleborafls, Haploxerafls, ABGR/PAMY
24-U26	Moderate relief uplands	Undiffer.	Below 4,500'	Some Exc.	Warm	Xerochrepts, Dystrochrepts, ABGR/PAMY
31-G10	Mountain slopelands	Granitics	Below 4,800'	Well	Cool	Vitrandepts, Dystrochrepts, THPL/PAMY
31-G20	Mountain slopelands	Granitics	Below 4,800'	Well	Warm	Dystrochrepts, Vitrandepts, THPL/PAMY
31-G45	Mountain slopelands	Granitics	Below 4,800'	Well & poor	All	Vitrandepts, Haplumbrepts, THPL/PAMY, alder
31-K10	Mountain slopelands	Gruss. granitics	Below 4,800'	Well	Cool	Vitrandepts, Dystrochrepts, THPL/PAMY
31-K20	Mountain slopelands	Gruss. granitics	Below 4,800'	Well	Warm	Dystrochrepts, Vitrandepts, THPL/PAMY
31-K26	Mountain slopelands	Gruss. granitics	Below 5,000'	Some. Exc.	Warm	Dystrochrepts, Xerorthents, ABGR/PAMY
31-Q10	Mountain slopelands	Quartzites	Below 4,800'	Well	Cool	Vitrandepts, Dystrochrepts, THPL/PAMY
31-Q20	Mountain slopelands	Quartzites	Below 4,800'	Well	Warm	Dystrochrepts, Vitrandepts, THPL/PAMY
31-Q25	Mountain slopelands	Quartzites	Below 4,800'	Some. Exc.	Warm	Xerochrepts, ABGR/PAMY
31-R10	Mountain slopelands	Revett quartzite	Below 4,800'	Well	Cool	Vitrandepts, Dystrochrepts, THPL/PAMY
31-R20	Mountain slopelands	Revett quartzite	Below 4,800'	Well	Warm	Dystrochrepts, Vitrandepts, THPL/PAMY
31-S10	Mountain slopelands	Mica schist	Below 4,800'	Well	Cool	Vitrandepts, Dystrochrepts, Glossoboralfs, THPL/PAMY
31-S20	Mountain Slopelands	Mica schist	Below 4,800'	Well	Warm	Dystrochrepts, Vitrandepts, Glossoboralfs, THPL/PAMY
31-S21	Mountain slopelands	Mica schist	Below 5,000'	Well	Warm	Vitrandepts, ABGR/PAMY
31-S25	Mountain slopelands	Mica schist	Below 4,800'	Well	Warm	Xerochrepts, ABGR/PAMY
31-S45	Mountain slopelands	Mica schist	Below 4,800'	Well & poor	All	Vitrandepts, Haplumbrepts, THPL/PAMY, alder
31-T10	Mountain slopelands	Basalt	Below 3,600'	Well	Cool	Glossoboralfs, THPL/PAMY
31-T20	Mountain slopelands	Basalt	Below 3,600'	Well	Warm	Glossoboralfs, THPL/PAMY
31-T25	Mountain slopelands	Basalt	Below 3,600'	Well	Warm	Glossoboralfs, ABGR/PAMY
31-T26	Mountain slopelands	Basalt	Below 4,800'	Some. Exc.	Warm	Haploxerafls, rock outcrop, ABGR/PAMY
31-U21	Mountain slopelands	Undiffer.	Below 5,000'	Well	Warm	Vitrandepts, ABGR/PAMY
31-U26	Mountain slopelands	Undiffer.	Below 5,000'	Some. Exc.	Warm	Xerochrepts, Dystrochrepts, ABGR/PAMY
31-U30	Mountain slopelands	Undiffer.	Below 5,000'	Excessive	Warm	Xerorthents, Xerochrepts, rock outcrop, PSME/PHMA
32-K66	Rounded mountain slopelands	Gruss. granitics	Above 4,800'	Well	Cool	Cryandepts, Cryochrepts, ABLA/MEFE
32-L66	Rounded mountain slopelands	Glacial till	Above 5,000'	Well	Cool	Cryandepts, Cryochrepts, ABLA/MEFE
32-L91	Rounded mountain slopelands	Glacial till	Above 4,800'	Well & poor	All	Cryandepts, Cryumbrepts, ABLA/PAMY, alder
32-R66	Rounded mountain slopelands	Revett quartzite	Above 4,800'	Well	Cool	Cryandepts, Cryochrepts, ABLA/MEFE
32-S60	Rounded mountain slopelands	Mica schist	Above 4,800'	Well	Cool	Cryandepts, Cryochrepts, ABLA/PAMY
32-S95	Rounded mountain slopelands	Mica schist	Above 4,800'	Well & poor	All	Cryoboralfs, Cryumbrepts, ABLA/PAMY, alder
32-U60	Rounded mountain slopelands	Undiffer.	Above 4,800'	Well	Cool	Cryandepts, Cryochrepts, ABLA/PAMY
32-U61	Rounded mountain slopelands	Undiffer.	Above 4,800'	Well	Cool	Cryumbrepts, Cryandepts, shrub., ABLA/PAMY
32-U66	Rounded mountain slopelands	Undiffer.	Above 5,000'	Well	Cool	Cryandepts, Cryochrepts, ABLA/MEFE
32-U70	Rounded mountain slopelands	Undiffer.	Above 4,500'	Well	Warm	Cryochrepts, ABLA/PAMY
32-U80	Rounded mountain slopelands	Undiffer.	Above 4,800'	Excessive	Warm	Cryochrepts, ABLA/XETE
32-U95	Rounded mountain slopelands	Undiffer.	Above 4,800'	Well & poor	All	Cryandepts, Cryumbrepts, ABLA/PAMY, alder

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SYMBOL	LANDFORM	PARENT MATERIAL	ELEVATION	DRAINAGE	ASPECT	SOIL VEGETATION
33-K80	Broadly rounded mountain uplands	Gruss.granitics	Above 4,800'	Excessive	Warm	Cryochrepts, ABLA/XETE
33-U66	Broadly rounded mountain uplands	Undiffer.	Above 5,000'	Well	Cool	Cryochrepts, ABLA/MEFE
33-U76	Broadly rounded mountain uplands	Undiffer.	Above 4,800'	Well	Warm	Cryumbrepts, grass, ABLA/XETE
33-U80	Broadly rounded mountain uplands	Undiffer.	Above 4,800'	Excessive	Warm	Cryochrepts, Cryandepts, ABLA/XETE
33-U86	Broadly rounded mountain uplands	Undiffer.	Above 5,500'	Excessive	Warm	Cryochrepts, Cryumbrepts, ABLA/XETE, ABLA/PIAL
33-U95	Broadly rounded mountain uplands	Undiffer.	Above 4,800'	Well & poor	All	Cryochrepts, Cryumbrepts, ABLA/PAMY, alder
34-U66	Steep, broadly rounded mountain uplands	Undiffer.	Above 5,000'	Well	Cool	Cryandepts, Cryochrepts, ABLA/MEFE
34-U76	Steep, broadly rounded mountain uplands	Undiffer.	Above 4,800'	Well	Warm	Cryumbrepts, grass, ABLA/XETE
34-U80	Steep, broadly rounded mountain uplands	Undiffer.	Above 4,800'	Excessive	Warm	Cryochrepts, ABLA/XETE
34-U86	Steep, broadly rounded mountain uplands	Undiffer.	Above 5,500'	Excessive	Warm	Cryochrepts, ABLA/VASC, ABLA/PIAL
36-L66	High elevation concave headlands	Glacial till	Above 5,000'	Well	Cool	Cryandepts, Cryochrepts, ABLA/PAMY, alder
36-U92	High elevation concave headlands	Undiffer.	Above 5,000'	Well & poor	All	Cryochrepts, Cryumbrepts, ABLA/PAMY, alder
38-L66	High elevation scoured uplands	Glacial till	Above 5,000'	Well	Cool	Cryandepts, Cryochrepts, ABLA/MEFE
38-L91	High elevation scoured uplands	Glacial till	Above 4,800'	Well & poor	All	Cryochrepts, Cryumbrepts, ABLA/PAMY, alder
38-L93	High elevation scoured uplands	Glacial till	Above 4,800'	Well & poor	All	Cryochrepts, Fragiumbrepts, ABLA/PAMY, ferns
38-U80	High elevation scoured uplands	Undiffer.	Above 5,000'	Excessive	Warm	Cryochrepts, ABLA/XETE
41-L91	Strongly scoured cirque basins, headwalls	Glacial till	Above	Well & poor	All	Rockland, Cryochrepts, ABLA/XETE, grass, ferns
42-L66	Weakly scoured cirque basins, headwalls	Glacial till	Above 5,000'	Well	Cool	Cryochrepts, ABLA/MEFE
42-L91	Weakly scoured cirque basins, headwalls	Glacial till	Above 5,000'	Well & poor	All	Cryochrepts, Cryumbrepts, ABLA/MEFE, alder
47-L66	Glacial trough bottoms	Glacial till	Above 5,000'	Well	Cool	Cryochrepts, Cryandepts, ABLA/MEFE
47-L91	Glacial trough bottoms	Glacial till	Above 4,800'	Well & poor	All	Cryochrepts, Cryumbrepts, ABLA/MEFE, alder
48-L66	Nondissected trough walls	Glacial till	Above 4,800'	Well	Cool	Cryochrepts, Cryandepts, ABLA/MEFE
48-L80	Nondissected trough walls	Glacial till	Above 4,800'	Excessive	Warm	Cryochrepts, rock outcrop, ABLA/XETE
48-L91	Nondissected trough walls	Glacial till	Above 4,800'	Well & poor	All	Cryochrepts, Cryumbrepts, ABLA/PAMY, alder

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SYMBOL	LANDFORM	PARENT MATERIAL	ELEVATION	DRAINAGE	ASPECT	SOIL VEGETATION
49-L66	Dissected trough walls	Glacial till	Above 4,000'	Well	Cool	Cryochrepts, Cryandepts, ABLA/MEFE
49-L80	Dissected trough walls	Glacial till	Above 4,800'	Excessive	Warm	Cryochrepts, rock outcrop, ABLA/XETE
49-L91	Dissected trough walls	Glacial till	Above 4,800'	Well & poor	All	Cryochrepts, Cryumbrepts, ABLA/PAMY, alder
50	Mass wasted slopes	All	2,000 to 6,000'	All	All	Inceptisols, Alfisols, THPL/PAMY, ABLA/PAMY
60-G10	Nondissected stream breaklands	Granitics	Below 4,800'	Well	Cool	Vitrandepts, Dystrochrepts, THPL/PAMY
60-G20	Nondissected stream breaklands	Granitics	Below 4,800'	Well	Warm	Dystrochrepts, Vitrandepts, THPL/PAMY
60-K10	Nondissected stream breaklands	Gruss. granitics	Below 4,800'	Well	Cool	Vitrandepts, Dystrochrepts, THPL/PAMY
60-K20	Nondissected stream breaklands	Gruss. granitics	Below 4,800'	Well	Warm	Dystrochrepts, Vitrandepts, THPL/PAMY
60-Q10	Nondissected stream breaklands	Quartzites	Below 4,800'	Well	Cool	Vitrandepts, Dystrochrepts, THPL/PAMY
60-Q20	Nondissected stream breaklands	Quartzites	Below 4,800'	Well	Warm	Dystrochrepts, Vitrandepts, THPL/PAMY
60-S10	Nondissected stream breaklands	Mica schist	Below 4,800'	Well	Cool	Vitrandepts, Dystrochrepts, Glossoboralfs, THPL/PAMY
60-S20	Nondissected stream breaklands	Mica schist	Below 4,800'	Well	Warm	Dystrochrepts, Vitrandepts, Glossoboralfs, THPL/PAMY
60-S26	Nondissected stream breaklands	Mica schist	Below 4,800'	Some. Exc.	Warm	Dystrochrepts, Xerochrepts, PSME/PHMA
60-U26	Nondissected stream breaklands	Undiffer.	Below 4,800'	Some. Exc.	Warm	Dystrochrepts, Xerochrepts, rock outcrops, ABGR/PAMY
60-U60	Nondissected stream breaklands	Undiffer.	Above 4,800'	Well	Cool	Cryandepts, Cryochrepts, ABLA/PAMY
60-U61	Nondissected stream breaklands	Undiffer.	Above 4,800'	Well	Cool	Cryumbrepts, Cryochrepts, shrubs
60-U66	Nondissected stream breaklands	Undiffer.	Above 4,800'	Well	Cool	Cryandepts, Cryochrepts, ABLA/MEFE
61-G10	Dissected stream breaklands	Granitics	Below 4,800'	Well	Cool	Vitrandepts, Dystrochrepts, THPL/PAMY
61-G20	Dissected stream breaklands	Granitics	Below 4,800'	Well	Warm	Dystrochrepts, Vitrandepts, THPL/PAMY
61-G44	Dissected stream breaklands	Granitics	Below 4,800'	Well & poor	All	Vitrandepts, Haplumbrepts, THPL/PAMY, alder
61-K10	Dissected stream breaklands	Gruss. granitics	Below 4,800'	Well	Cool	Vitrandepts, Dystrochrepts, THPL/PAMY
61-K20	Dissected stream breaklands	Gruss. granitics	Below 4,800'	Well	Warm	Dystrochrepts, THPL/PAMY
61-K30	Dissected stream breaklands	Gruss. granitics	Below 5,000'	Excessive	Warm	Xerochrepts, rock outcrop, ABGR/PAMY
61-Q10	Dissected stream breaklands	Quartzites	Below 4,800'	Well	Cool	Vitrandepts, Dystrochrepts, THPL/PAMY
61-Q20	Dissected stream breaklands	Quartzites	Below 4,800'	Well	Warm	Dystrochrepts, Vitrandepts, THPL/PAMY
61-R10	Dissected stream breaklands	Revett quartzite	Below 4,800'	Well	Cool	Vitrandepts, Dystrochrepts, THPL/PAMY
61-R20	Dissected stream breaklands	Revett quartzite	Below 4,800'	Well	Warm	Dystrochrepts, THPL/PAMY
61-S10	Dissected stream breaklands	Mica schist	Below 4,800'	Well	Cool	Vitrandepts, Dystrochrepts, Glossoboralfs, THPL/PAMY
61-S20	Dissected stream breaklands	Mica schist	Below 4,800'	Well	Warm	Dystrochrepts, Glossoboralfs, THPL/PAMY
61-S26	Dissected stream breaklands	Mica schist	Below 4,800'	Some. Exc.	Warm	Dystrochrepts, Xerochrepts, ABGR/PAMY
61-S44	Dissected stream breaklands	Mica schist	Below 4,800'	Well & poor	All	Vitrandepts, Haplumbrepts, Glossoboralfs, THPL/PAMY, alder

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SYMBOL	LANDFORM	PARENT MATERIAL	ELEVATION	DRAINAGE	ASPECT	SOIL VEGETATION
61-S60	Dissected stream breaklands	Mica schist	Above 4,800'	Well	Cool	Cryoboralfs, Cryandepts, ABLA/PAMY
61-T10	Dissected stream breaklands	Basalts	Below 3,600'	Well	Cool	Glossoboralfs, THPL/PAMY
61-T20	Dissected stream breaklands	Basalts	Below 3,600'	Well	Warm	Glossoboralfs, THPL/PAMY
61-U26	Dissected stream breaklands	Undiffer.	Below 4,800'	Some. Exc.	Warm	Dystrochrepts, Xerochrepts, rock outcrops, ABGR/PAMY
61-U30	Dissected stream breaklands	Undiffer.	Below 4,800'	Excessive	Warm	Xerochrepts, rock outcrops, ABGR/PAMY
61-U31	Dissected stream breaklands	Undiffer.	Below 5,000'	Excessive	Warm	Rockland, Xerorthents, PSME/PHMA
61-U60	Dissected stream breaklands	Undiffer.	Above 4,800'	Well	Cool	Cryandepts, Cryochrepts, ABLA/PAMY
61-U61	Dissected stream breaklands	Undiffer.	Above 4,800'	Well	Cool	Cryumbrepts, Cryochrepts, shrubs
61-U66	Dissected stream breaklands	Undiffer.	Above 5,000'	Well	Cool	Cryandepts, Cryochrepts, ABLA/MEFE
61-U70	Dissected stream breaklands	Undiffer.	Above 4,800'	Well	Warm	Cryochrepts, ABLA/PAMY
61-U92	Dissected stream breaklands	Undiffer.	Above 4,800'	Well & poor	All	Cryumbrepts, Cryochrepts, ABLA/PAMY, alder
61-U96	Dissected stream breaklands	Undiffer.	Above 4,000'	Well & poor	All	Cryochrepts, Cryumbrepts, shrubs, alder
63-G10	Stream headlands	Granitics	Below 4,800'	Well	Cool	Vitrandepts, Dystrochrepts, THPL/PAMY
63-G20	Stream headlands	Granitics	Below 4,800'	Well	Warm	Dystrochrepts, Vitrandepts, THPL/PAMY
63-G26	Stream headlands	Granitics	Below 4,800'	Some. Exc.	Warm	Dystrochrepts, Xerochrepts, rock outcrops, ABGR/PAMY
63-G44	Stream headlands	Granitics	Below 4,800'	Well & poor	All	Vitrandepts, Haplumbrepts, THPL/PAMY, alder
63-S10	Stream headlands	Mica schist	Below 4,800'	Well	Cool	Vitrandepts, Glossoboralfs, THPL/PAMY
63-S26	Stream headlands	Mica schist	Below 4,800'	Some. Exc.	Warm	Dystrochrepts, Xerochrepts, ABGR/PAMY
63-S44	Stream headlands	Mica schist	Below 5,000'	Well & poor	All	Vitrandepts, Haplumbrepts, Glossoboralfs, THPL/PAMY, alder
63-U80	Stream headlands	Undiffer.	Above 4,800'	Excessive	Warm	Cryochrepts, ABLA/XETE
63-U92	Stream headlands	Undiffer.	Above 4,800'	Well & poor	All	Cryandepts, Cryumbrepts, ABLA/PAMY, alder

MISCELLANEOUS UNITS

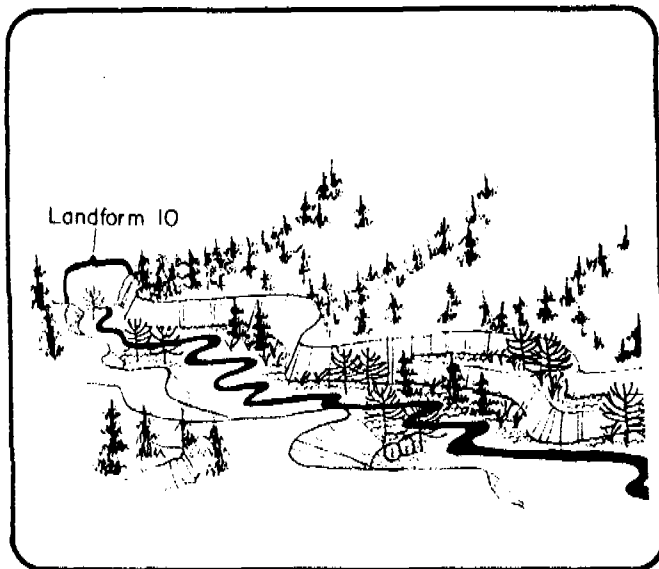
A = Avalanche areas

R = Rock outcrops

T = Talus slopes



LANDTYPE 10-A40



SUMMARY

Number of map delineations - 118
Total acreage - 6,600
Average map unit acreage - 56

These units are located on low elevation flood plains and terraces. Soils include both well and poorly drained types with deep profiles developed in alluvial parent material. The habitat type is western red cedar/pachistima and lady fern with riparian vegetation in wet areas.

LANDFORM 10 - FLOODPLAINS AND RECENT TERRACES

Overall relief consists of nearly level to level flood plains and terraces which are adjacent to major rivers and streams. The unit often includes old meander scars and cutoff stream channels. Adjoining map units have highly contrasting landforms such as mountain slopes or stream breaklands.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 1,600 to 4,500 feet and lower elevation frost pockets
- B. Slope Gradient - 0 to 10%
- C. Slope Shape - Nearly level with hummocky topography in areas of old stream meanders
- D. Overall Relief - Less than 100 feet
- E. Dissection Relief - Less than 50 feet
- F. Dissection Density - N/A

SLOPE HYDROLOGY

DRAINAGE PATTERN: Floodplain

STREAM DENSITY: 7-17 miles/mile²
MEAN: 9.5 miles/mile²

PRIMARY STREAM ORDER: 3-5 (75%)

CHANNEL TYPE: Meandering and active; parabolic cross section; high width/depth ratio; cobble/boulder substrate and banks.

SLOPE WATER MOVEMENT: High water table, slow lateral water movement.

SEDIMENT DELIVERY: Very efficient, any storage is temporary.

OTHER IMPORTANT CHARACTERISTICS: Floodplains can be inundated by overbank flows frequently. Lateral bank cutting and overflow channels and bar formation is common. A large master stream usually flows longitudinally through the unit.

PARENT MATERIAL GROUP

This group is composed of local drainage bedrock material which has been transported and mixed by water, then deposited elsewhere. The rounded gravel, cobbles, and stones reflect the lithology of the drainage.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,500 feet on all aspects. Soil profiles are 60+ inches deep. Well drained soils have a modified volcanic ash surface 6 to 12 inches thick. Poorly drained soils have a darkened surface 3 to 7 inches thick. Subsurface soil is medium to coarse textured with 20 to 60% rock fragments. Perched water tables are common.

TYPICAL SOIL PROFILES

(Well drained soil)

Surface Soil - 0 to 9" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 6 to 12" thick).

Subsoil - 9 to 17" brown silt loam with weak subangular blocky structure, slightly sticky, nonplastic, 20% rock fragments, (range 5 to 12" thick).

Substratum - 17 to 60+ pale brown coarse sandy loam, structureless, nonsticky, nonplastic, with 20 to 60% rock fragments.

(Poorly drained soil)

Surface soil - 0 to 5" very dark, greyish brown silt loam with weak, subangular blocky structure, nonsticky, nonplastic (range 3 to 7" thick).

Subsoil - 5 to 13" dark brown gravelly silt loam with weak subangular blocky structure, nonsticky, nonplastic, 20 to 30% rock fragments (range 5 to 15" thick).*

Substratum - 13 to 60+ pale brown gravelly sandy loam, structureless, nonsticky, nonplastic, 20 to 30% rock fragments.*

*NOTE: Seasonal high water tables occur in these horizons.

SOIL CLASSIFICATION - Fluvents, Aquepts, Ochrepts and Aquepts.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Soils range from sandy profiles to gravelly types laid down by high energy flood water.

VEGETATIVE CHARACTERISTICS - Dominant habitat types on well drained sites are western red cedar/pachistima (THPL/PAMY) and western red cedar/lady fern (THPL/ATF1). Poorly drained sites have riparian ferns, forbs, sedges, and grasses.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect low potential hazard ratings. However, because of the proximity to major streams, sediment producing activities have the potential for watershed degradation.

ENGINEERING - Potential engineering problems occur only where roads are constructed in very close proximity to streams where flooding or erosion directly in the stream can take place. Cutbank sloughing, rapid brush encroachment and treadwear in bouldery material are maintenance problems.

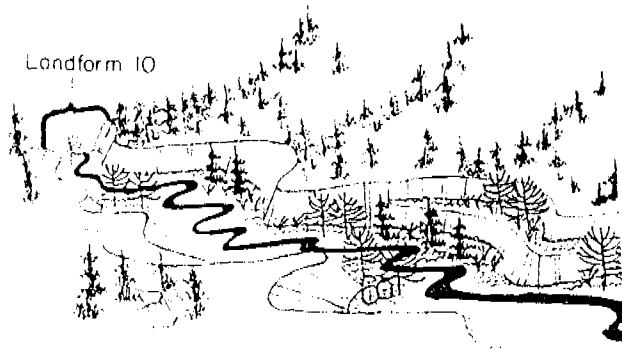
SILVICULTURE - This landtype has regeneration limitations due to seasonal water tables, as well as severe climax fern and forb competition. The soil compaction hazard rating is high, especially in wet areas. The windthrow class rating is high because of shallow rooting in wet areas.

POTENTIAL WILDLIFE HABITAT - This landtype is rated high in potential for both summer and winter wildlife habitat. This riparian landtype has ample diversity and normally is accessible during winter months for wildlife.



LANDTYPE 10-A90

Landform 10



SUMMARY

Number of map delineations - 32
Total acreage - 5,500
Average map unit acreage - 171

These units are located on high elevation floodplains and terraces. Soils include both well and poorly drained types with deep profiles developed in alluvial parent material. The habitat type is subalpine fir/pachistima with riparian vegetation in wet areas.

LANDFORM 10 - FLOODPLAINS AND RECENT TERRACES

Overall relief consists of nearly level to level flood plains and terraces which are adjacent to major rivers and streams. The unit often includes old meander scars and cutoff stream channels. Adjoining map units have highly contrasting landforms such as mountain slopes or stream breaklands.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 4,500 to 5,800 feet and in lower elevation frost pockets
- B. Slope Gradient - 0 to 10%
- C. Slope Shape - Nearly level with hummocky topography in areas of old stream meanders
- D. Overall Relief - Less than 100 feet
- E. Dissection Relief - Less than 50 feet
- F. Dissection Density - N/A

SLOPE HYDROLOGY

DRAINAGE PATTERN: Floodplain

STREAM DENSITY: 7-17 miles/mile²
MEAN: 9.5 miles/mile²

PRIMARY STREAM ORDER: 3-5 (75%)

CHANNEL TYPE: Meandering and active; parabolic cross section; high width/depth ratio; cobble/boulder substrate and banks.

SLOPE WATER MOVEMENT: High water table, slow lateral water movement.

SEDIMENT DELIVERY: Very efficient, any storage is temporary.

OTHER IMPORTANT CHARACTERISTICS: Floodplains can be inundated by overbank flows frequently. Lateral bank cutting and overflow channels and bar formation is common. A large master stream usually flows longitudinally through the unit.

PARENT MATERIAL GROUP

This group is composed of geologic material developed from local bedrock which has been transported and deposited by water. The rounded gravel, cobbles, and stones are relatively unweathered and reflect the lithology of the drainage.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations above 4,500 feet on all aspects. Soil profiles are 60+ inches deep. Well drained soils have a modified volcanic ash surface 5 to 13 inches thick. Poorly drained soils have a darkened surface 3 to 7 inches thick. Subsurface soil is medium to coarse textured with 10 to 60% rock fragments. Perched water tables are common.

TYPICAL SOIL PROFILES

(Well drained soil)

Surface Soil - 0 to 10" dark brown silt loam with weak granular structure, nonsticky, nonplastic (range 5 to 13" thick).

Subsoil - 10 to 18" brown silt loam with weak subangular blocky structure, slightly sticky, nonplastic, 10% rock fragments (range 5 to 12" thick).

Substratum - 18 to 60+" pale brown very gravelly coarse sandy loam, structureless, nonsticky, nonplastic with 40 to 60% rock fragments.

(Poorly drained soil)

Surface Soil - 0 to 5" very dark greyish brown silt loam with weak subangular blocky structure, nonsticky, nonplastic, (range 3 to 7" thick).

Subsoil - 5 to 13" dark brown gravelly silt loam with weak subangular blocky structure, nonsticky, nonplastic, 20 to 30% rock fragments (range 5 to 15" thick).*

Substratum - 13 to 60+" pale brown very gravelly sandy loam, structureless, nonsticky, nonplastic, 30 to 60% rock fragments.*

*Note: Seasonal high water tables occur in these horizons.

SOIL CLASSIFICATION - Cryofluvents and Cryaquents, Cryochrepts, and Cryaquepts.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Major inclusions are deep sandy soils and organic soils occurring as buried sand bars and old filled in stream channel cutoffs.

VEGETATIVE CHARACTERISTICS - The dominant habitat type on well drained sites is subalpine fir/pachistima (ABLA/PAMY). Poorly drained sites have riparian ferns, forbs, sedges, grasses, and shrubs. Frost pockets are common.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect low potential hazard ratings. However, because of close proximity to major streams, sediment producing activities have a high potential for watershed damage.

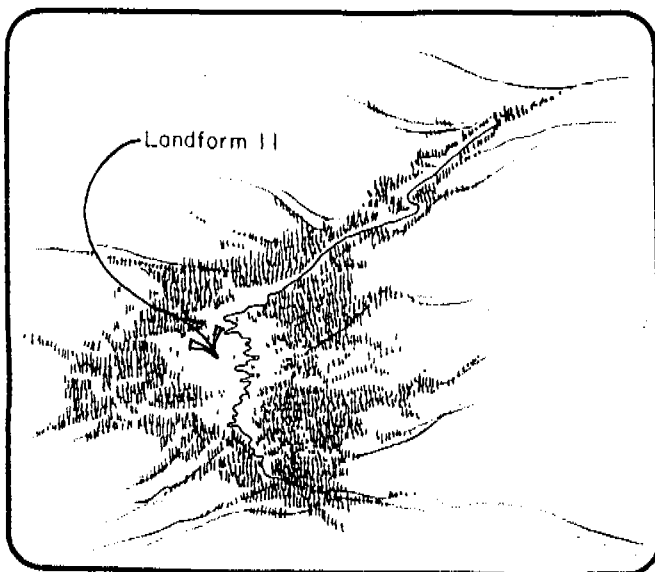
ENGINEERING - Potential engineering problems occur only where roads are constructed in very close proximity to streams where flooding or erosion directly into the stream can take place. Cutbank sloughing, rapid brush encroachment, and treadwear in bouldery material are maintenance problems.

SILVICULTURE - Limitations are a high soil compaction hazard and regeneration problems related to seasonal high water tables with severe brush and fern competition. Overstory removal commonly results in the formation of frost pockets. The windthrow hazard is high for this landtype.

POTENTIAL WILDLIFE HABITAT - This landtype has properties such as food, water, cover, and vegetative diversity which are important components of wildlife habitat. Because of the high elevation, this landtype is inaccessible in the winter and has high potential primarily as summer range.



LANDTYPE 11-A40



SUMMARY

Number of map delineations - 81
Total acreage - 12,200
Average map unit acreage - 150

These units occur on low elevation, low energy flood plains. Soils are deep, dominantly poorly drained, and are developed in alluvium. Vegetation consists of western red cedar, western hemlock, and subalpine fir with a flood tolerant pachistima union understory.

LANDFORM 11 BOTTOMLANDS, MEADOWS

Overall relief consists of gently sloping to level bottomlands, old terraces and meadows located in broad valleys with meandering streams. Surrounding relief is gentle and meandering streams are common.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 2,500 to 4,800 feet
- B. Slope Gradient - 10%
- C. Slope Shape - Smooth and flat to slightly concave vertically
- D. Dissection Relief - 10 feet
- E. Dissection Density - N/A

SLOPE HYDROLOGY

DRAINAGE PATTERN: Meandering

STREAM DENSITY: 8-12 miles/mile²
MEAN: 12.75 miles/mile²

PRIMARY STREAM ORDER: 3 and 4 (45%)

CHANNEL TYPE: Rectangular in cross section with undercut banks; pool-riffle complex; generally fine substrate and banks.

SLOPE WATER MOVEMENT: High water table except driest portion of summer, slow lateral water movement.

SEDIMENT DELIVERY: Poor except in proximity to streams; storage usually long term.

OTHER IMPORTANT CHARACTERISTICS: Terraces are not considered active floodplains although overflows occur in proximity to streams. Slow channel migration is common. Riparian vegetation exists throughout including shrubs thriving on water.

Streams are very sensitive to changes of flow and sediment, but both must usually be generated outside the unit. A master stream usually meanders through the unit.

PARENT MATERIAL GROUP

This material is deposited by low energy or stagnant water. The result is generally fine textured material which reflects the lithology of the drainage area, and generally has few rock fragments.

SOIL-VEGETATIVE UNIT

This unit occurs between 2,500 and 4,800 feet on all aspects. The soils are characterized by poor drainage, evidence of stratification, and some influence from volcanic ash on the surface. They have a 3 to 7-inch darkened surface horizon over gleyed or mottled subsoils that range from loose to compact sandy loams to clays. Vegetation is a wet or occasionally flooded phase of western red cedar-western hemlock habitat type.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 6" dark greyish brown silt loam or loam with weak platy and granular structure, friable, slightly sticky, slightly plastic, (range 5 to 10" thick).

Subsoil (1) - 6 to 32" greyish brown to grey silt loam with weak subangular blocky structure, friable, slightly sticky, slightly plastic, (range 10 to 40" thick).

Subsoil (2) - 32 to 55" greyish brown silty clay loam with moderate prismatic structure, firm, sticky, plastic with many moderately thick clay films on ped faces, (range 10 to 40" thick).

Substratum - 55 to 72"+ greenish to bluish grey loam, structureless, friable, nonsticky and nonplastic, 15 to 30% rounded gravels.

SOIL CLASSIFICATION - Ochraqualfs.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Soils vary in degree of wetness, texture, amount of volcanic ash, depth of organic surface horizon, and degree of soil development. The wettest soils and those with the thickest surface horizons occur in depressions and low areas near the waterways. Texture and amount of rock fragment are related to the alluvial source and the energy of the depositional event. They vary from sandy to clayey with a few that have more than 20% rock fragments. Soils with well preserved volcanic ash caps occur on the highest portions which are least disturbed by recurring flooding. Positions of soils with well developed horizons as opposed to poorly developed soils are not easily described but attention must be paid to this fact for some management considerations.

VEGETATIVE CHARACTERISTICS - Low elevation grasses, sedges, and forbs tolerant of flooding and high water tables associated with western red cedar, western hemlock, subalpine fir, grand fir, and spruce. Generally, the trees do not form a dense overstory. The subalpine fir and spruce occur in severe frost pockets.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect moderate subsoil and high parent material erosion potentials. Because of the proximity of this unit to active streams, any sediment producing activities have the potential for watershed degradation.

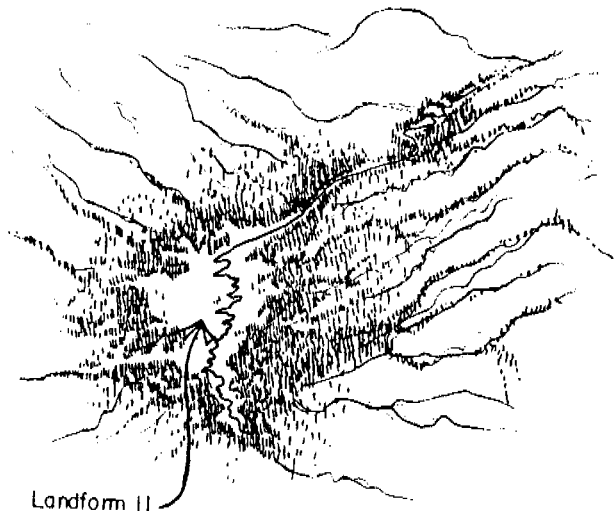
ENGINEERING - Potential engineering problems occur only where roads are constructed in very close proximity to streams where flooding or erosion directly into the stream can take place. Rapid brush encroachment and road tread rutting or erosion are maintenance problems.

SILVICULTURE - This landtype has regeneration limitations related to seasonal high water tables over much of the area.

POTENTIAL WILDLIFE HABITAT - This landtype is rated high in potential for summer habitat because of abundant food, water, cover, and diversity. Winter habitat potential is rated high at lower elevations where snow accumulation does not limit access.



LANDTYPE 11-A47



Landform 11

SUMMARY

Number of map delineations - 59
Total acreage - 4,950
Average map unit acreage - 84

These units are located on low elevation bottomlands and old terraces. Soils include both well and poorly drained types with deep profiles developed in alluvial parent material. Vegetation consists of grasses, sedges, and forbs in bottomlands or meadows with fringes of western red cedar.

LANDFORM 11 BOTTOMLANDS, MEADOWS

Overall relief consists of gently sloping to level bottomlands, old terraces and meadows located in broad valleys with meandering streams. Surrounding relief is gentle and meandering streams are common.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 2,500 to 4,500 feet
- B. Slope Gradient - 10%
- C. Slope Shape - Smooth and flat to slightly concave vertically
- D. Dissection Relief - 10 feet
- E. Dissection Density - N/A

SLOPE HYDROLOGY

DRAINAGE PATTERN: Meandering

STREAM DENSITY: 8-12 miles/mile²
MEAN: 12.75 miles/mile²

PRIMARY STREAM ORDER: 3 and 4 (45%)

CHANNEL TYPE: Rectangular in cross section with undercut banks; pool-riffle complex; generally fine substrate and banks.

SLOPE WATER MOVEMENT: High water table except driest portion of summer, slow lateral water movement.

SEDIMENT DELIVERY: Poor except in proximity to streams; storage usually long term.

OTHER IMPORTANT CHARACTERISTICS: Terraces are not considered active floodplains although overflows occur in proximity to streams. Slow channel migration is common. Riparian vegetation exists throughout including shrubs thriving on water.

Streams are very sensitive to changes of flow and sediment, but both must usually be generated outside the unit. A master stream usually meanders through the unit.

PARENT MATERIAL GROUP

This material is deposited by low energy or stagnant water. The result is generally fine textured material which reflects the lithology of the drainage area, and generally has few rock fragments.

SOIL-VEGETATION UNIT-

This unit occurs at elevations below 4,500 feet on all aspects. Soil profiles are 60+ inches deep. Well drained soils have a modified volcanic ash surface 5 to 15 inches thick. Poorly drained meadow soils have a darkened, modified surface 6 to 15 inches thick. Subsurface soil is medium to fine textured with 10 to 30% rock fragments. Naturally dense fragipan layers may occur in meadows causing perched water.

TYPICAL SOIL PROFILES

(Well drained soil)

Surface Soil - 0 to 12" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 5 to 15" thick).

Subsoil - 12 to 23" brown silty clay loam, angular blocky structure, sticky, plastic, 10 to 20% rounded gravels (range 9 to 23" thick).

Substratum - 23 to 60"+ pale brown gravelly silt loam, structureless, slightly sticky, slightly plastic, 20 to 30% rounded gravels.

(Poorly drained soil)

Surface Soil - 0 to 8: very dark brown silt loam with weak subangular blocky structure, nonsticky, nonplastic (range 6 to 15" thick).

Subsoil - 8 to 23" dark greyish (mottled) brown gravelly clay loam, moderate subangular blocky structure, sticky, plastic, 15 to 25% rock fragments (range 15 to 31" thick).*

Substratum - 23 to 60"+ pale brown gravelly loam, structureless, slightly sticky, nonplastic, 15 to 25% rock fragments.*

*NOTE: Water table and fragipans may occur at depths of from 12 to 48 inches.

SOIL CLASSIFICATION - Glossoboralfs and Fragiboralfs.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Frost pockets are common over much of the mapping unit. These areas may have cryic soil temperature regimes. Major inclusions are deep, sandy soils in pockets near stream channels and soils with organic surface horizons with permanent high water tables.

VEGETATIVE CHARACTERISTICS - Low elevation grasses, sedges, and forbs occur in meadows with islands and fringes of western red cedar habitat types. Subalpine fir habitat types occupy frost pockets. Spruce (PIEN) is common on many of the sites.

MANAGEMENT CONSIDERATIONS

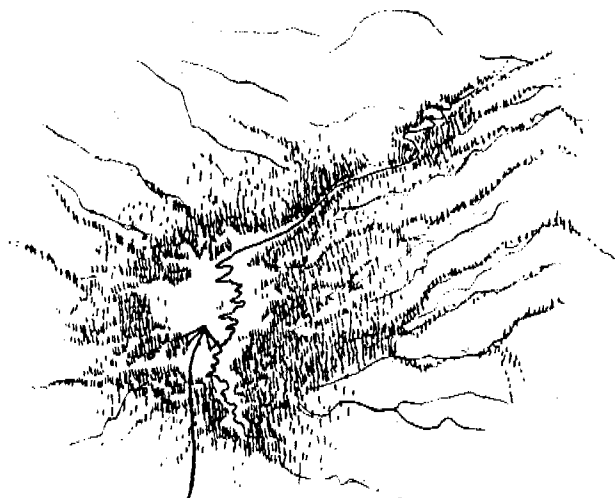
WATERSHED - Watershed interpretations reflect a high rating for parent material erosion. Streamside areas with unconsolidated, fine textured soils are subject to erosion damage by livestock.

ENGINEERING - Potential engineering problems occur only where roads are constructed in very close proximity to streams where flooding or erosion directly into the stream can take place. Rapid brush encroachment and road tread rutting or erosion are maintenance problems.

SILVICULTURE - Soil compaction potential is high on this landtype because of soil textures and high water tables. Animal and machine traffic should be carefully evaluated in these areas. Most of this unit is wet during at least half of the growing season, posing a limitation for regeneration. Vegetation removal may result in frost pocket formation, also affecting regeneration.

POTENTIAL WILDLIFE HABITAT - This landtype has important properties associated with wildlife habitat including food, water, cover, and vegetative diversity. These bottomlands and meadows are potential range for elk, deer, and small fur bearers. Such low elevation areas are especially important for elk winter range.

LANDTYPE 11-A97



Landform 11

SUMMARY

Number of map delineations - 42

Total acreage - 3,800

Average map unit acreage - 90

These units are located on high elevation bottomlands and meadows. Soils include both well and poorly drained types with deep profiles developed in alluvial parent material. Vegetation consists of grass, sedges, and forbs in bottomlands and meadows with subalpine fir or spruce on the fringes.

LANDFORM 11 BOTTOMLANDS, MEADOWS

Overall relief consists of gently sloping to level bottomlands, old terraces and meadows located in broad valleys with meandering streams. Surrounding relief is gentle and meandering streams are common.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - Above 4,500 feet
- B. Slope Gradient - 10%
- C. Slope Shape - Smooth and flat to slightly concave vertically
- D. Dissection Relief - 10 feet
- E. Dissection Density - N/A

SLOPE HYDROLOGY

DRAINAGE PATTERN: Meandering

STREAM DENSITY: 8-12 miles/mile²
MEAN: 12.75 miles/mile²

PRIMARY STREAM ORDER: 3 and 4 (45%)

CHANNEL TYPE: Rectangular in cross section with undercut banks; pool-riffle complex; generally fine substrate and banks.

SLOPE WATER MOVEMENT: High water table except driest portion of summer, slow lateral water movement.

SEDIMENT DELIVERY: Poor except in proximity to streams; storage usually long term.

OTHER IMPORTANT CHARACTERISTICS: Terraces are not considered active floodplains although overflows occur in proximity to streams. Slow channel migration is common. Riparian vegetation exists throughout including shrubs thriving on water.

Streams are very sensitive to changes of flow and sediment, but both must usually be generated outside the unit. A master stream usually meanders through the unit.

PARENT MATERIAL GROUP A-ALLUVIUM

Parent material for this unit includes reworked tills and glacial outwash consisting of gravels, sands, and glacial flour. Lithology reflects that of the drainage area.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations above 4,500 feet on all aspects. Soil profiles are 60+ inches deep. Well drained soils have a modified volcanic ash surface 5 to 16 inches thick. Poorly drained meadow soils have a darkened, modified surface 7 to 15 inches thick. Subsurface soil is medium to coarse textured with 10 to 30% rock fragments. Naturally dense fragipan layers may occur in meadows causing perched water.

TYPICAL SOIL PROFILES

(Well drained soil)

Surface Soil - 0 to 11" dark brown silt loam with weak granular structure, nonsticky, nonplastic (range 5 to 16" thick).

Subsoil - 11 to 24" brown gravelly sandy loam, angular blocky structure, sticky, plastic, 10 to 20% rounded gravel (range 9 to 22" thick).

Substratum - 24 to 60"+ pale brown gravelly silt loam, structureless, slightly sticky, slightly plastic, 20 to 30% rounded gravels.

(Poorly drained soil)

Surface Soil - 0 to 10" very dark brown silt loam with weak subangular block structure, nonsticky, nonplastic (range 7 to 15" thick).

Subsoil - 10 to 24" dark greyish brown (mottled) gravelly sandy loam, moderate subangular blocky structure, sticky plastic, 15 to 30% rock fragments (range 10 to 30" thick).*

Substratum - 24 to 60"+ pale brown gravelly loam, structureless, slightly sticky, nonplastic, 15 to 30% rock fragments.*

*NOTE: Water tables and fragipans may occur at depths of 12 to 48 inches.

SOIL CLASSIFICATION - Cryaquepts and Cryumbrepts.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Major inclusions are deep, sandy soils in pockets near stream channels and organic soils.

VEGETATIVE CHARACTERISTICS - High elevation meadows with grasses, sedges, and forbs containing islands and fringes of subalpine fir or spruce habitat types.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a high parent material erosion hazard. However, because of the proximity to major streams, sediment producing activities have the potential for watershed damage.

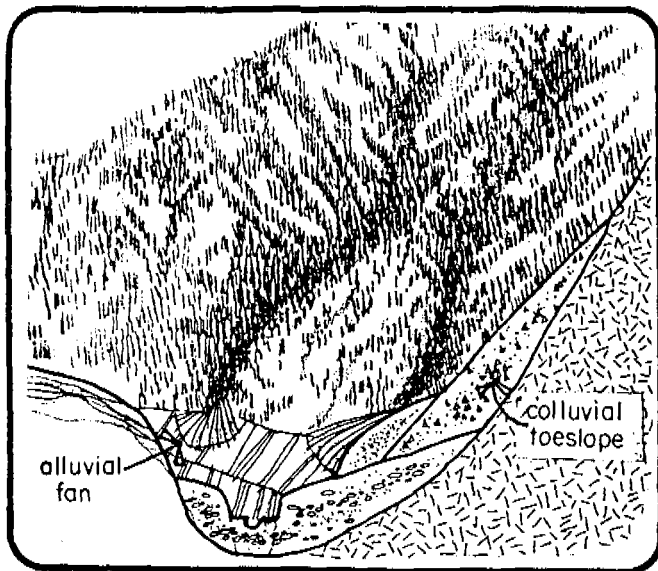
ENGINEERING - Potential engineering problems occur only where roads are constructed in very close proximity to streams where flooding or erosion directly into the stream can take place. Cutbank sloughing and rapid brush encroachment commonly require maintenance.

SILVICULTURE - This landtype has regeneration problems related to seasonal high water tables and colored umbric soils. The soil compaction hazard rating is high on this unit.

POTENTIAL WILDLIFE HABITAT - This landtype is rated high in potential for summer habitat. This unit is rated low for winter habitat because of snow accumulation and inaccessibility.



LANDTYPE 15-U00



SUMMARY

Number of map delineations - 200
Total acreage - 6,300
Average map unit acreage - 32

These units are located on low elevation colluvial toeslopes, and fans. Soils are deep, well drained, and are developed in undifferentiated parent material. The habitat type is western red cedar/pachistima.

LANDFORM 15-COLLUVIAL TOESLOPES, ALLUVIAL FANS

Overall relief ranges from moderately steep (20 to 40%) alluvial fans to steep (40 to 60%) on colluvial toeslopes. Toeslopes occur below and adjacent to oversteepened slopes. Fans normally form at the mouth of high energy low order streams.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - Variable
- B. Slope Gradient - 20 to 40% fans, 40 to 60% toeslopes debris
- C. Slope Shape - Straight to concave vertically, variable laterally (toeslopes), convex (fans)
- D. Overall Relief - 50 to 200 feet (toeslopes), 20 to 75 feet (fans)
- E. Dissection Density - N.A.

SLOPE HYDROLOGY

DRAINAGE PATTERN: Variable and changing

STREAM DENSITY: 1-11 miles/mile²
MEAN: Variable miles/mile²

PRIMARY STREAM ORDER: Variable

CHANNEL TYPE: Poorly entrenched; often braided; very unstable; high width/depth ratio.

SLOPE WATER MOVEMENT: Mostly subsurface, seeps and springs are common. This unit acts as a buffer of flows from adjoining slopes and active stream courses.

SEDIMENT DELIVERY: Variable, but generally a function of the number of channels and the frequency of flooding.

PARENT MATERIAL GROUP

This group includes deep unconsolidated colluvial material with large percentages of slightly to moderately weathered rock fragments.



SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,800 feet on all aspect slopes. Soil profiles are 60+ inches deep. Surface soil is volcanic ash 10 to 20 inches thick. Subsurface soil is coarse textured with 20 to 60% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 16" dark brown silt loam, with weak granular structure, nonsticky, nonplastic (range 10 to 20" thick).

Subsoil - 16 to 36" brown gravelly sandy loam with granular structure, nonsticky, nonplastic, 20 to 45% rock fragments (range 8 to 40" thick).

Substratum - 36 to 60"+ pale brown gravelly sandy loam, structureless, nonsticky, nonplastic, 20 to 60% rock fragments.

SOIL CLASSIFICATION - Vitrandepts and Dystrochrepts.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Ash caps are mixed to the extent they won't qualify as "andic" in areas of active colluvial movement. Weak alfisols may occur in moist draws.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is western red cedar/pachistima (THPL/PAMY).

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a high rotational mass wasting potential and a high sediment delivery efficiency rating. Other ratings are low to moderate.

ENGINEERING - Potential engineering problems include a high mass wasting hazard with a high rate of sediment being delivered to streams. Cutbank sloughing and rapid brush encroachment are common maintenance problems. Seeps and springs are common and may result in cutbank failure.

SILVICULTURE - There are no major silvicultural regeneration limitations for this landtype.

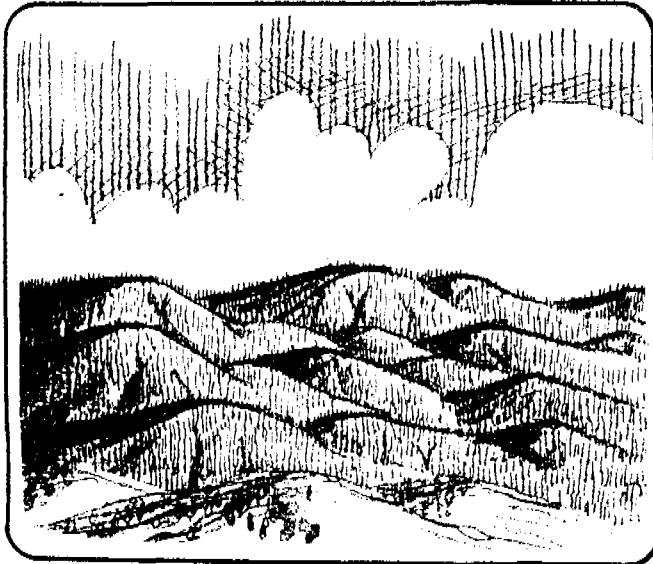
POTENTIAL WILDLIFE HABITAT - This landtype is rated as having moderate potential for summer habitat. Where elevations are low enough to be accessible during periods of snow accumulation, winter habitat is rated as moderate.



5 11

183

LANDTYPE 22-A00



SUMMARY

Number of map delineations - 153
Total acreage - 23,000
Average map unit acreage - 150

These landtypes are low elevation, low relief rolling hills and uplands occurring on the western edge (Palouse District) of the Forest. Parent material is loess or silty alluvium derived from loess with some basalt influence. Soils are deep, moderately well drained, and have dense horizons of clay accumulation and/or cementation. The habitat type is western red cedar and hemlock/pachistima.

LANDFORM 22-LOW RELIEF HILLS

Overall relief consists of gently rolling, low relief hills and uplands. Drainage patterns are dense and well developed with concave draws which have 10 to 50% depositional material.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 2,600 to 3,600 feet
- B. Slope Gradient - 10 to 30%
- C. Slope Shape - Slopes are compound having broad weakly convex to flat ridgetops 100 to 300 feet wide. Sideslopes are convex both laterally and vertically with broad concave draws. Slope lengths range from 60 to 300 feet in length.
- D. Overall Relief - 100 to 300 feet
- E. Dissection Relief - 15 to 200 feet
- F. Dissection Density - 20 to 30 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Dendritic

STREAM DENSITY: 1-5 miles/mile²
MEAN: 3.25 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (85%)

CHANNEL TYPE: Moderate to high width/depth ratio; pool-run complex; gravel beds; lateral development, some meandering.

SLOPE WATER MOVEMENT: Generally subsurface with deep percolation. Streams head low on slopes. Water yield is very well regulated.

SEDIMENT DELIVERY: Low to moderate with good storage capacity; sediment and debris accumulate for several years and then are infrequently discharged as impulse loading to lower parts of the system.

OTHER IMPORTANT CHARACTERISTICS: Channels are extremely sensitive to changes in water yields or sediment loadings. Water yields can be significantly increased by vegetative management, but the nature of slopes moderates runoff throughout the year.

PARENT MATERIAL GROUP

This landtype has developed on Palouse loess alluvium derived from Palouse loess, lacustrine material from the Latah Interbeds, and the Columbia River basalts.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 3,600 feet on all aspects. Soil profiles are 60+ inches deep. Soils are only moderately well drained because dense subsoil horizons limit water permeability and create temporary high water tables during the spring of the year. The soils have 14+ inches of volcanic ash on the surface. Subsoils are silt loams and silty clay loams with horizons of clay accumulation, some of which are cemented into fragipans.

TYPICAL SOIL PROFILES

(With fragipan)

Surface Soil - 0 to 19" dark yellowish brown silt loam (volcanic ash), weak granular and subangular blocky structure, very friable, slightly sticky and slightly plastic, (range 10 to 30" thick).

Subsoil (1) - 19 to 43" yellowish brown silt loam, weak subangular blocky structure, friable, slightly sticky, slightly plastic, (range 10 to 30" thick).

Subsoil (2) - 43 to 62"+ dark yellowish brown silt loam, moderate prismatic structure, very firm and brittle, sticky, plastic, clay films on ped faces and lining pores, (range 10 to 50" thick).

Substratum - Usually a continuing series of old buried soils or silty alluvium.

SOIL CLASSIFICATION - Typic Fragiboralfs, coarse-silty, mixed, frigid, thick ash phase.

(Without fragipan)

Soil is essentially the same as the one described above except for the second layer of the subsoil, which is a brown silty clay loam, firm but not brittle, sticky, plastic, subangular, blocky and prismatic structure, with clay films on ped faces and lining pores.

SOIL CLASSIFICATION - Andeptic Paleboralfs, medial/loamy, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - There is no pattern of variation between soils with and without fragipans except that fragipans almost always occur on alluvial terrace remnants and rarely occur on soils strongly influenced by basalt and therefore, more clayey. Some areas, especially with south and west exposures, have ash caps less than 14 inches thick. These landtypes include areas of wet soils associated with drainages and concave areas. In addition, they include small areas of shallower, rocky soils where dissections reach the basalt. High water tables may occur above fragipan layers during late spring.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is western red cedar/pachistima (THPL/PAMY), while western hemlock/pachistima (TSHE/PAMY) types occur on the west end of the Palouse District. Seral communities tend to be dominated by grand fir which, over time, deteriorate due to stress from the water extremes of this landtype.

MANAGEMENT CONSIDERATIONS

WATERSHED - The watershed inter-relationships reflect high subsoil and parent material erosion hazards. Other ratings are very low to moderate.

ENGINEERING - Potential road construction problems include high parent material erosion rates in the excavated road prism. Subsoils have low bearing strengths and are subject to severe roadbed rutting if exposed to traffic when wet. Cutbank sloughing and road ditch erosion are common maintenance problems.

SILVICULTURE - This landtype is rated as having high sensitivity, due primarily to the presence of the naturally dense fragipan layer in the subsoil. This fragipan may perch water at certain times of the year and pose a limitation to regeneration. This unit has a high windthrow hazard rating due to shallow rooting of trees.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate in potential for summer habitat. Winter range potential is rated moderate at low elevations where snow accumulation does not limit access.



LANDTYPE 22-A03



SUMMARY

Number of map delineations - 19
Total acreage - 2,700
Average map unit acreage - 142

These landtypes are low elevation, low relief rolling hills and uplands occurring on the western (Palouse District) edge of the Forest. Soils are moderately well drained with deep profiles developed in loess or alluvium parent material. Soils may contain naturally dense fragipan layers. The habitat types are western red cedar and western hemlock/pachistima.

LANDFORM 22-LOW RELIEF HILLS

Overall relief consists of gently rolling, low relief hills and uplands. Drainage patterns are dense and well developed with concave draws which have 10 to 50% depositional material.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 2,600 to 4,000 feet
- B. Slope Gradient - 10 to 30%
- C. Slope Shape - Slopes are compound having broad weakly convex to flat ridgetops 100 to 300 feet wide. Sideslopes are convex both laterally and vertically with broad concave draws. Slope lengths range from 60 to 300 feet in length.
- D. Overall Relief - 100 to 300 feet
- E. Dissection Relief - 15 to 200 feet
- F. Dissection Density - 20 to 30 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Dendritic

STREAM DENSITY: 1-5 miles/mile²
MEAN: 3.25 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (85%)

CHANNEL TYPE: Moderate to high width/depth ratio; pool-run complex; gravel beds; lateral development, some meandering.

SLOPE WATER MOVEMENT: Generally subsurface with deep percolation. Streams head low on slopes. Water yield is very well regulated.

SEDIMENT DELIVERY: Low to moderate with good storage capacity; sediment and debris accumulate for several years and then are infrequently discharged as impulse loading to lower parts of the system.

OTHER IMPORTANT CHARACTERISTICS: Channels are extremely sensitive to changes in water yields or sediment loadings. Water yields can be significantly increased by vegetative management, but the nature of slopes moderates runoff throughout the year.

PARENT MATERIAL GROUP

This landtype has developed on Palouse loess and alluvium derived from Palouse loess, and deeply weathered Libby Formation siltites, and Columbia River basalt.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,000 feet on all aspects along the western edge of the Forest. Soils are 60+ inches deep and moderately well to well drained, with moderately slow to very slow permeability. The surface is an organic matter enriched silt loam. This grades into a horizon at depth of clay accumulation which is sometimes cemented into a fragipan.

TYPICAL SOIL PROFILES

(With fragipan)

Surface Soil - 0 to 10" dark yellowish brown silt loam with subangular blocky and granular structure, friable, slightly sticky, slightly plastic, (range 5 to 15" thick).

Subsoil - 10 to 29" light brownish gray light silt loam, structureless, firm, slightly sticky, slightly plastic, (range 10 to 30" thick).

Substratum - Usually a series of old buried soils which alternate between the two types of subsoils described above, although the brittleness of the fragipan disappears.

SOIL CLASSIFICATION - Typic Fragiboralfs, coarse-loamy, mixed, frigid.

(Without fragipan)

Surface Soil - 0 to 10" dark brown silt loam with granular and subangular blocky structure, friable, slightly sticky, and slightly plastic, (range 4 to 15" thick).

Subsoil (1) - 10 to 45" dark brown to yellowish brown silt loam with subangular blocky structure, firm, slightly sticky, slightly plastic, (range 20 to 50" thick).

Subsoil (2) - 45 to 65" brown to dark yellowish brown silt loam with prismatic structure, very firm, sticky, plastic and clay films on ped faces and lining pores.

Substratum - Usually a continuing series of buried soils which are similar to the two subsoils described above.

SOIL CLASSIFICATION - Typic Paleboralf, coarse-silty, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - The variation between fragipans and nonfragipan soils appear to be related to whether or not the loess has been water transported. Therefore, the fragipan soils tend to be on terraces and lower landform positions while the nonfragipan soils are on the upper slopes of the landform. Included in this landtype are some soils with thin volcanic ash caps and some wet soils along drainages and in concavities. A few areas have soils that are developing in Libby Formation siltite.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is western red cedar/pachistima (THPL/PAMY), with western hemlock/pachistima (TSHE/PAMY) occurring on the western edge of the District. This landtype is on the dry end of the cedar/hemlock range.

MANAGEMENT CONSIDERATIONS

WATERSHED - The watershed interpretations reflect high subsoil and parent material erosion hazards. Other ratings are very low to moderate.

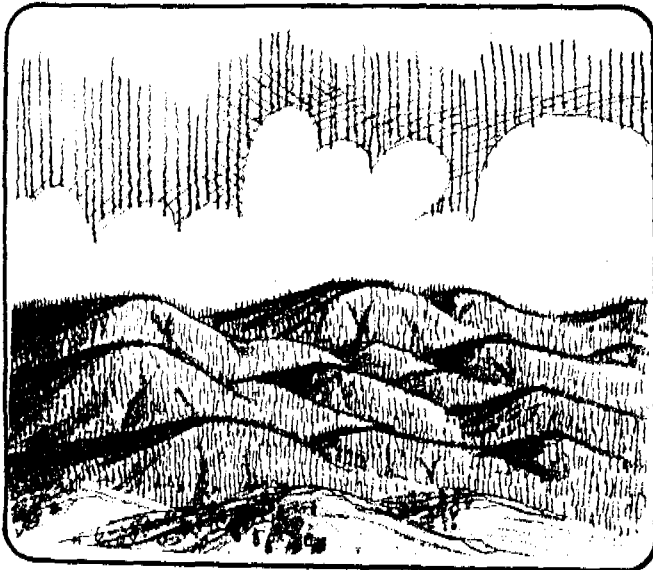
ENGINEERING - Potential road construction problems include high parent material erosion rates in the excavated road prism. Subsoils have low bearing strengths and are subject to severe roadbed rutting if exposed to traffic when wet. Cutbank sloughing and road ditch erosion are maintenance problems.

SILVICULTURE - This landtype is rated as having a high sensitivity due primarily to the presence of the naturally dense fragipan layer in the subsoil. This fragipan may perch water at certain times of the year and pose a limitation to regeneration. This unit has a high windthrow hazard rating due to the shallow rooting of trees. The surface soil compaction potential rating is very high because of the absence of an ash cap.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate in potential for summer habitat. Winter range potential is rated moderate at low elevations where snow accumulation does not limit access.



LANDTYPE 22-A06



SUMMARY

Number of map delineations - 43
Total acreage - 6,500
Average map unit acreage - 151

These landtypes are low elevation, low relief rolling hills and uplands occurring on the western edge (Palouse District) of the Forest. Parent material is loess or alluvium derived from loess with some basalt influence. Soils are deep, well drained, and have dense fragipan subsurface layers. The habitat type is grand fir/pachistima.

LANDFORM 22-LOWRELIEF HILLS

Overall relief consists of gently rolling, low relief hills and uplands. Drainage patterns are dense and well developed with concave draws which have 10 to 50% depositional material.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 2,600 to 3,600 feet
- B. Slope Gradient - 10 to 30%
- C. Slope Shape - Slopes are compound having broad weakly convex to flat ridgetops 100 to 300 feet wide. Sideslopes are convex both laterally and vertically with broad concave draws. Slope lengths range from 60 to 300 feet in length.
- D. Overall Relief - 100 to 300 feet
- E. Dissection Relief - 15 to 200 feet
- F. Dissection Density - 20 to 30 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Dendritic

STREAM DENSITY: 1-5 miles/mile²
MEAN: 3.25 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (85%)

CHANNEL TYPE: Moderate to high width/depth ratio; pool-run complex; gravel beds; lateral development, some meandering.

SLOPE WATER MOVEMENT: Generally subsurface with deep percolation. Streams head low on slopes. Water yield is very well regulated.

SEDIMENT DELIVERY: Low to moderate with good storage capacity; sediment and debris accumulate for several years and then are infrequently discharged as impulse loading to lower parts of the system.

OTHER IMPORTANT CHARACTERISTICS: Channels are extremely sensitive to changes in water yields or sediment loadings. Water yields can be significantly increased by vegetative management, but the nature of slopes moderates runoff throughout the year.

PARENT MATERIAL GROUP

This landtype has developed on Palouse loess, alluvium derived from Palouse loess, lacustrine material from the Latah Interbeds and the deeply weathered Columbia River basalts.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 3,600 feet on all aspects. Soil profiles are 60+ inches deep. Soils are only moderately well drained because dense subsoil horizons limit water permeability and create temporary high water tables during the spring of the year. The soils have 14+ inches of volcanic ash on the surface. Subsoils are silt loams and silty clay loams with horizons of clay accumulation, some of which are cemented into fragipans.

TYPICAL SOIL PROFILES

(With fragipan)

Surface Soil - 0 to 19" dark yellowish brown silt loam, weak granular structure, very friable, slightly sticky, slightly plastic, (range 10 to 30" thick).

Subsoil (1) - 19 to 43" yellowish brown silt loam, weak subangular blocky structure, friable, slightly sticky, slightly plastic, (range 10 to 40" thick).

Subsoil (2) - 43 to 62"+ dark yellowish brown silt loam, moderate prismatic structure, very firm and brittle, sticky, plastic, clay films on ped faces, (range 10 to 50" thick).

Substratum - Usually a continuing series of old buried soils or silty alluvium.

SOIL CLASSIFICATION - Typic Fragiboralfs, coarse-silty, mixed, frigid.

(Without fragipan)

This soil is essentially the same as the above profile except the second layer of the subsoil which is a brown silty clay loam, firm (not brittle), sticky, plastic, subangular blocky and prismatic structure, with clay films on ped faces.

SOIL CLASSIFICATION - Andeptic Paleboralfs, medial/loamy, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - There is no pattern of variation between soils with and without fragipans except that fragipans almost always occur on alluvial terrace remnants and rarely occur on soils strongly influenced by basalt and, therefore, more clayey. Some areas, especially with south and west exposures, have ash surfaces less than 14" thick. These landtypes include areas of wet soils associated with drainages and concave areas. In addition, they include small areas of shallow, rocky soils where dissections reach the basalt. High water tables may occur above the fragipans in late spring.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is grand fir/pachistima (ABGR/PAMY) at the moist end of the range. Soils in this unit indicate that these may be western red cedar sites. These units evidently occur where rainfall is too low to support western red cedar.

MANAGEMENT CONSIDERATIONS

WATERSHED - The watershed interpretations reflect high subsoil and parent material erosion hazards. Other ratings are very low to moderate.

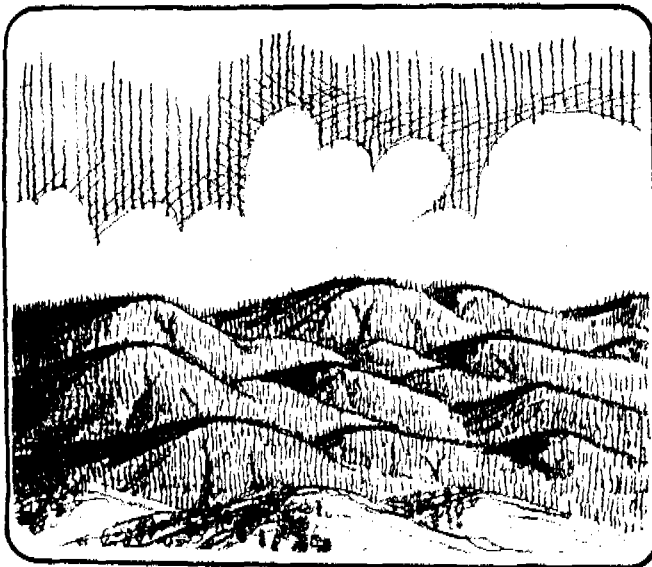
ENGINEERING - Potential road construction problems include high parent material erosion rates in the excavated road prism. Subsoils have low bearing strengths and are subject to severe road bed rutting if exposed to traffic when wet. Cutbank sloughing and road ditch erosion are common maintenance problems.

SILVICULTURE - This landtype is rated as having a high sensitivity due primarily to the presence of the naturally dense fragipan layer in the subsoil. This fragipan layer may perch water at certain times of the year and poses a limitaton to regeneration. This unit has a high windthrow hazard rating due to the shallow rooting of trees.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate in potential for summer habitat. Winter range potential is rated moderate at low elevations where snow accumulation does not limit access.



LANDTYPE 22-A07



SUMMARY

Number of map delineations - 26
Total acreage - 2,300
Average map unit acreage - 88

These landtypes are low elevation, low relief rolling hills and uplands occurring on the western edge (Palouse District) of the Forest. Parent material is loess or alluvium derived from loess with some basalt influence. Soils are deep, well drained, and may have dense fragipan subsurface layers. The habitat type is grand fir/pachistima.

LANDFORM 22-LOW RELIEF HILLS

Overall relief consists of gently rolling, low relief hills and uplands. Drainage patterns are dense and well developed with concave draws which have 10 to 50% depositional material.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 2,600 to 4,000 feet
- B. Slope Gradient - 10 to 30%
- C. Slope Shape - Slopes are compound having broad weakly convex to flat ridgetops 100 to 300 feet wide. Sideslopes are convex both laterally and vertically with broad concave draws. Slope lengths range from 60 to 300 feet in length.
- D. Overall Relief - 100 to 300 feet
- E. Dissection Relief - 15 to 200 feet
- F. Dissection Density - 20 to 30 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Dendritic

STREAM DENSITY: 1-5 miles/mile²
MEAN: 3.25 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (85%)

CHANNEL TYPE: Moderate to high width/depth ratio; pool-run complex; gravel beds; lateral development, some meandering.

SLOPE WATER MOVEMENT: Generally subsurface with deep percolation. Streams head low on slopes. Water yield is very well regulated.

SEDIMENT DELIVERY: Low to moderate with good storage capacity; sediment and debris accumulate for several years and then are infrequently discharged as impulse loading to lower parts of the system.

OTHER IMPORTANT CHARACTERISTICS: Channels are extremely sensitive to changes in water yields or sediment loadings. Water yields can be significantly increased by vegetative management, but the nature of slopes moderates runoff throughout the year.

PARENT MATERIAL GROUP

This landtype has developed on Palouse loess, alluvium derived from Palouse loess, lacustrine material from the Latah Interbeds and deeply weathered Columbia River basalts.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,000 feet on all aspects. Soil profiles are 60+ inches deep. Soils are only moderately well drained. The surface soil is an organic matter enriched silt loam. Subsoils are silt loams with horizons of clay accumulation, some of which are cemented into fragipans.

TYPICAL SOIL PROFILES

(With fragipan)

Surface Soil - 0 to 10" dark yellowish brown silt loam with subangular blocky and granular structure, friable, slightly sticky, slightly plastic, (range 5 to 15" thick).

Subsoil - 10 to 29" light brownish gray light silt loam, structureless, firm, slightly sticky, slightly plastic, (range 10 to 30" thick).

Substratum - This is usually a series of old buried soils which alternate between two types of subsoils described above, although the brittleness of the fragipan disappears.

SOIL CLASSIFICATION - Typic Fragiboralfs, coarse-silty, mixed, frigid.

(Without fragipan)

Surface Soil - 0 to 10" dark brown silt loam with granular and subangular blocky structure, friable, slightly sticky, and slightly plastic, (range 4 to 15" thick).

Subsoil (1) - 10 to 45" dark brown to yellowish brown silt loam with subangular blocky structure, firm, slightly sticky, slightly plastic, (range 20 to 50" thick).

Subsoil (2) - 45 to 65" brown to dark yellowish brown silt loam with prismatic structure, very firm, sticky, plastic, with clay films on ped faces.

Substratum - Usually a continuing series of buried soils which are similar to the two subsoils described above.

SOIL CLASSIFICATION - Typic Paleboralfs, coarse-silty, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - The variation between fragipan and nonfragipan soils appears to be related to whether or not the Loess has been water transported. Therefore, the fragipan soils tend to be on terraces and lower landform positions while the nonfragipan soils are on the upper slopes of the landform. Included in this landtype are some soils with thin volcanic ash surfaces and some wet soils along drainages and in concavities. A few areas have soils that are developing in Libby Formation siltites. High water tables may occur in late spring in this unit.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is grand fir/pachistima (ABGR/PAMY).

MANAGEMENT CONSIDERATIONS

WATERSHED - The watershed interpretations reflect high subsoil and parent material erosion hazards. Other ratings are very low to moderate.

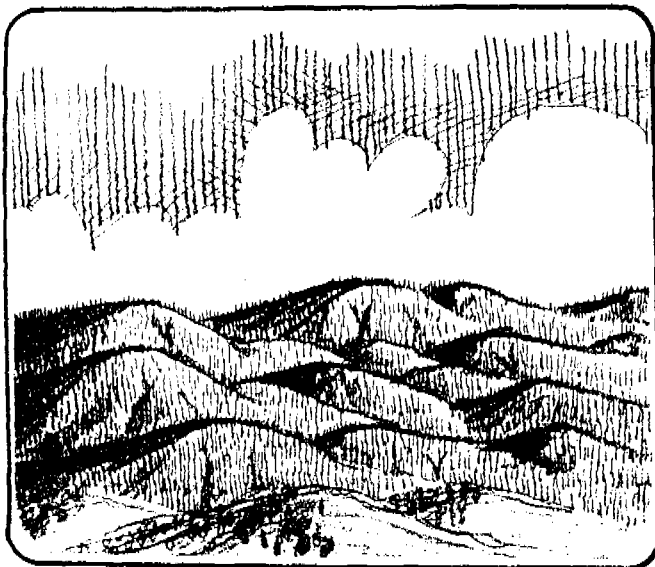
ENGINEERING - Potential road construction problems include high parent material erosion rates in the excavated road prism. Subsoils have low bearing strengths and are subject to severe road bed rutting if exposed to traffic when wet. Cutbank sloughing and road ditch erosion are maintenance problems.

SILVICULTURE - This landtype is rated as having a high sensitivity due primarily to the presence of the naturally dense fragipan layer in the subsoil. This fragipan layer may perch water at certain times of the year and poses a limitation to regeneration. Other regeneration problems are related to droughty soils with missing ash caps. This unit is rated high for windthrow hazard and very high for compaction potential.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate in potential for summer habitat. Winter range potential is rated moderate at low elevations where snow accumulation does not limit access.



LANDTYPE 22-600



SUMMARY

Number of map delineations - 88
Total acreage - 12,300
Average map unit acreage - 140

These units are located on low elevation, low relief rolling hills and uplands. Soils are deep, well drained, and are developed in granitic parent material. The habitat type is western red cedar/pachistima.

LANDFORM 22-LOW RELIEF HILLS

Overall relief consists of gently rolling, low relief hills and uplands. Drainage patterns are dense and well developed with concave draws which have 10 to 50% depositional material.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 2,600 to 4,800 feet
- B. Slope Gradient - 10 to 30%
- C. Slope Shape - Slopes are compound having broad weakly convex to flat ridgetops 100 to 300 feet wide. Sideslopes are convex both laterally and vertically with broad concave draws. Slope lengths range from 60 to 300 feet in length.
- D. Overall Relief - 100 to 300 feet
- E. Dissection Relief - 15 to 200 feet
- F. Dissection Density - 4 to 8 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Dendritic

STREAM DENSITY: 1-5 miles/mile²
MEAN: 3.25 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (85%)

CHANNEL TYPE: Moderate to high width/depth ratio; pool-run complex; gravel beds; lateral development, some meandering.

SLOPE WATER MOVEMENT: Generally subsurface with deep percolation. Streams head low on slopes. Water yield is very well regulated.

SEDIMENT DELIVERY: Low to moderate with good storage capacity; sediment and debris accumulate for several years and then are infrequently discharged as impulse loading to lower parts of the system.

OTHER IMPORTANT CHARACTERISTICS: Channels are extremely sensitive to changes in water yields or sediment loadings. Water yields can be significantly increased by vegetative management, but the nature of slopes moderates runoff throughout the year.

PARENT MATERIAL GROUP

This group includes deeply weathered granites and associated gneisses from the Idaho Batholith. The Palouse District has areas which have migmatite intrusions.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,800 feet on all aspect slopes. Soil profiles are 60+ inches deep. Surface soil is volcanic ash 8 to 28 inches thick. Subsurface soil is coarse textured with 5 to 40% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 18" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 8 to 28" thick).

Subsoil - 18 to 38" brown sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 5 to 40% rock fragments, (range 12 to 30" thick).

Substratum - 38 to 60"+ pale brown sandy loam to loamy sand, structureless, nonsticky, nonplastic, 10 to 30% rock fragments.

SOIL CLASSIFICATION - Typic Vitrandepts, medial/loamy, mixed, frigid.

DISTRIBUTION, VARIATIONS, AND INCLUSIONS - The major variation is ash cap depth with thinner caps on points and ridgetops. Soils with finer textured subsoils (alfisols) occur as inclusions in moist draws. Soils with gussic (sandy) parent materials can occur. See general geologic description of G series for more details. Temperature data indicates soils may be cryic rather than frigid, under cool, moist hemlock vegetation on the Palouse District.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is western red cedar/pachistima (THPL/PAMY). On the Palouse District, approximately half of this landtype has western hemlock/pachistima (TSHE/PAMY) vegetation.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a high parent material erosion potential. Exposed subsurface soils on roads and skid trails are subject to severe erosion hazards. Other watershed ratings are very low to moderate.

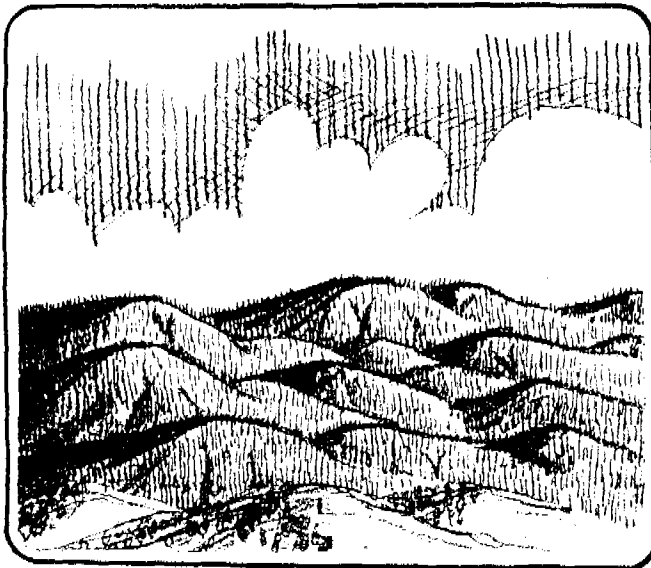
ENGINEERING - Potential road construction problems include high parent material erosion rates in the excavated road prism. Dry cutbank raveling is a common maintenance problem.

SILVICULTURE - This landtype has no major silvicultural regeneration limitations. The high productivity of this landtype can be maintained by insuring that the ash topsoil is not removed or displaced.

POTENTIAL WILDLIFE HABITAT - This landtype is rated as having moderate potential for summer habitat. Where elevations are low enough to be accessible during periods of snow accumulation, winter habitat is rated moderate.



LANDTYPE 22-601



SUMMARY

Number of map delineations - 26
Total acreage - 5,400
Average map unit acreage - 208

These units are located on low elevation, low relief, rolling hills and uplands on the west end of the Forest (Palouse District). Soils are deep, moderately well to well drained, and are developed in granitic parent material. The habitat type is western red cedar and western hemlock/pachistima.

LANDFORM 22-LOW RELIEF HILLS

Overall relief consists of gently rolling, low relief hills and uplands. Drainage patterns are dense and well developed with concave draws which have 10 to 50% depositional material.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 2,600 to 4,000 feet
- B. Slope Gradient - 10 to 30%
- C. Slope Shape - Slopes are compound having broad weakly convex to flat ridgetops 100 to 300 feet wide. Sideslopes are convex both laterally and vertically with broad concave draws. Slope lengths range from 60 to 300 feet in length.
- D. Overall Relief - 100 to 300 feet
- E. Dissection Relief - 15 to 200 feet
- F. Dissection Density - 30 to 40 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Dendritic

STREAM DENSITY: 1-5 miles/mile²
MEAN: 3.25 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (85%)

CHANNEL TYPE: Moderate to high width/depth ratio; pool-run complex; gravel beds; lateral development, some meandering.

SLOPE WATER MOVEMENT: Generally subsurface with deep percolation. Streams head low on slopes. Water yield is very well regulated.

SEDIMENT DELIVERY: Low to moderate with good storage capacity; sediment and debris accumulate for several years and then are infrequently discharged as impulse loading to lower parts of the system.

OTHER IMPORTANT CHARACTERISTICS: Channels are extremely sensitive to changes in water yields or sediment loadings. Water yields can be significantly increased by vegetative management, but the nature of slopes moderates runoff throughout the year.

PARENT MATERIAL GROUP

This group includes a wide range of medium intrusive rock types. It includes granite, textured granodiorite, quartz monzonite, tonalite, and migmatic intrusions, all of which are highly weathered.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,000 feet on all aspects. Soil profiles are 60+ inches deep. Soils vary from being weakly developed to strongly developed with horizons of clay accumulation. The surface is capped by 8 to 28 inches of volcanic ash. The subsurface is sandy loam or loam with 10 to 20% gravel.

TYPICAL SOIL PROFILES

Surface Soil - 0 to 18" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 8 to 28" thick).

Subsoil - 18 to 38" brown sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 5 to 10% rock fragments, (range 12 to 30" thick).

Substratum - 38 to 60"+ pale brown sandy loam to loamy sand, structureless, nonsticky, nonplastic, 10 to 20% rock fragments.

SOIL CLASSIFICATION - Typic Vitrandepts, medial/loamy, mixed, frigid.

Surface Soil - 0 to 11" dark brown silt loam with granular structure, very friable, slightly sticky, nonplastic, (range 8 to 28" thick).

Subsoil (1) - 11 to 52" yellowish brown silt loam to sandy loam with subangular blocky structure, friable, nonsticky, nonplastic, (range 20 to 50" thick).

Subsoil (2) - 52 to 65"+ strong brown heavy sandy loam or sandy clay loam with subangular blocky structure, friable, slightly sticky, slightly plastic, clay films lining pores and ped faces.

Substratum - These soils generally grade into a highly decomposed granite with much clay bridging the sand grains.

SOIL CLASSIFICATION - Andeptic Paleboralf, coarse-loamy, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - The major variations are the depth of ash cap and the degree of clay accumulation in the subsoil. The soils with thin ash caps occur on south slopes and convex landforms. The soils with clay accumulation in the subsoils occur on gently straight to concave slopes. This landtype includes areas of steep south facing slopes with thinner, sandier soils which support grand fir habitat types. A few soils on terraces have fragipans. About 5% of the soils are wet and occur along drainages and in concave areas.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is western red cedar/pachistima. Western hemlock/pachistima types occur in the west end of the Palouse District. This landtype has about 5% inclusion of grand fir/pachistima on steep south facing slopes.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a high parent material erosion hazard. Other ratings are very low to moderate.

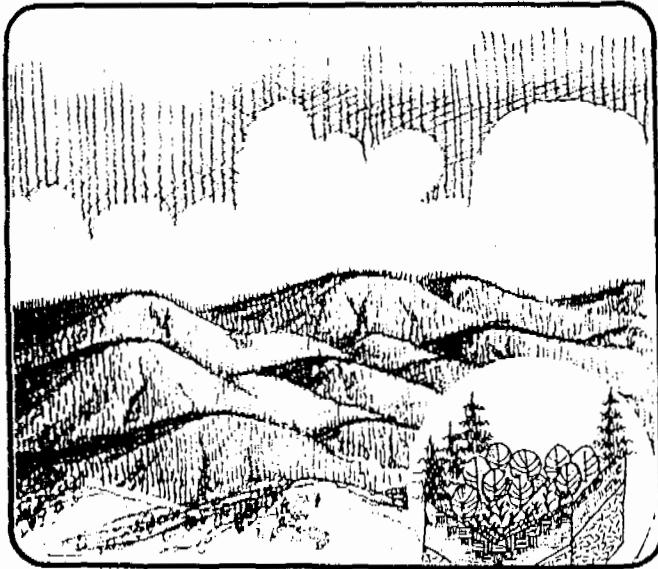
ENGINEERING - Potential road construction problems include high parent material erosion rates in the excavated road prism. Cutbank raveling and rutting of road surfaces are common maintenance problems.

SILVICULTURE - There are no major silvicultural limitations for this landtype.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate in potential for summer habitat. Winter range potential is rated moderate at low elevations where snow accumulation does not limit access.



LANDTYPE 22-645



SUMMARY

Number of map delineations - 67
Total acreage - 3,000
Average map unit acreage - 45

These units are located on low elevation, low relief rolling hills and uplands. Soils are well drained on ridges, poorly drained in draws, and have deep profiles developed in granite parent material. The habitat type is western red cedar/pachistima with riparian vegetation in wet draws.

LANDFORM 22-LOWRELIEF HILLS

Overall relief consists of gently rolling, low relief hills and uplands. Drainage patterns are dense and well developed with concave draws which have 10 to 50% depositional material.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 3,600 to 4,800 feet
- B. Slope Gradient - 10 to 30%
- C. Slope Shape - Slopes are compound having broad weakly convex to flat ridgetops 100 to 300 feet wide. Sideslopes are convex both laterally and vertically with broad concave draws. Slope lengths range from 60 to 300 feet in length.
- D. Overall Relief - 100 to 300 feet
- E. Dissection Relief - 15 to 200 feet
- F. Dissection Density - 30 to 40 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Dendritic

STREAM DENSITY: 1-5 miles/mile²
MEAN: 3.25 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (85%)

CHANNEL TYPE: Channel banks and beds are poorly defined and contain higher proportions of fine.

SLOPE WATER MOVEMENT: Water movement in draws and swales is subsurface with frequent springs, seeps, and bogs. Interfluvies are well drained with significant subsurface flows.

SEDIMENT DELIVERY: Moderate with good storage capacity.

OTHER IMPORTANT CHARACTERISTICS: Streams are sensitive to increases in sediment and water yield, but such changes must usually be generated outside the unit. Water yield can be altered by vegetative management but it is regulated by the slopes.

PARENT MATERIAL GROUP

This group includes granites and associated gneisses of the Idaho Batholith. Ridgetop parent material is deeply weathered with moderate weathering on steeper sideslopes.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,800 feet on all aspect slopes. Soil profiles are 60+ inches deep. Well drained ridge soils have a volcanic ash surface 8 to 28 inches thick. Poorly drained soils have a darkened, modified volcanic ash surface 10 to 26 inches thick. Subsurface soil is coarse textured with 10 to 40% rock fragments. Naturally dense fragipan layers may occur in wet draws.

TYPICAL SOIL PROFILES

(Well drained soil)

Surface Soil - 0 to 18" dark brown silt loam with weak granular structure, nonsticky, nonplastic, less than 10% rock fragments (range 8 to 28" thick).

Subsoil - 18 to 38" brown sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 10 to 40% rock fragments (range 12 to 30" thick).

Substratum - 38 to 60"+ pale brown sandy loam, loamy sand, structureless, nonsticky, nonplastic, 10 to 40% rock fragments.

(Poorly drained soil - draws)

Surface Soil - (modified ash) 0 to 15" very dark brown to black silt loam, weak granular structure, slightly sticky, nonplastic, less than 10% rock fragments (range 10 to 26" thick).

Subsoil/Substratum - 15"+ usually poorly drained, range from gleyed sandy material to gravelly, loamy fragipans.

SOIL CLASSIFICATION - Typic Vitrandepts, medial/loamy, mixed, frigid, and Typic Haplumbrepts, medial/loamy, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Soils with gussic (sandy) parent material can occur in this unit. Rock content in these profiles is generally less than 35% (nonskeletal) and increases as elevation increases. Soils with thin ash caps occur on ridgetops and points. Weakly expressed A lfsols may occur in draws.

VEGETATIVE CHARACTERISTICS - The dominant habitat types on well drained ridges are western red cedar/pachistima (THPL/PAMY) and grand fir/pachistima (ABGR/PAMY). Poorly drained areas have alder fern, and sedge vegetation. Dense areas of fern growth may be present.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a high parent material erosion potential. Other ratings are very low to moderate.

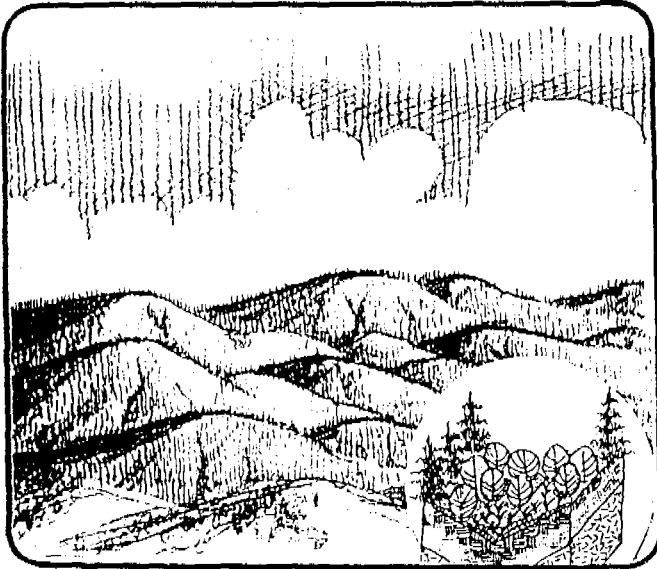
ENGINEERING - Potential road construction problems are associated with wet draws and high parent material erosion rates in the excavated road prism. Cutbank raveling, rapid brush encroachment and cutbank sloughing are common maintenance problems.

SILVICULTURE - Regeneration limitations for this landtype are related to severe brush competition, high water tables and dark colored umbric soils, all of which are dominant in wet draw areas. Soil compaction potential is also rated high in wet parts at this unit. Ridges and other well drained portions of this landtype have few silvicultural limitations.

POTENTIAL WILDLIFE HABITAT - This landtype is rated high for potential wildlife summer range because of high diversity. Where elevations are low enough to be accessible during periods of snow accumulation, winter habitat is rated high.



LANDTYPE 22-G95



SUMMARY

Number of map delineations - 36
Total acreage - 1,600
Average map unit acreage - 44

These units are located on high elevation, low relief rolling hills and uplands. Soils are well drained on ridges, poorly drained in draws and have deep profiles developed in granitic parent material. The habitat type is subalpine fir/pachistima with riparian vegetation in wet draws.

LANDFORM 22-LOW RELIEF HILLS

Overall relief consists of gently rolling, low relief hills and uplands. Drainage patterns are dense and well developed with concave draws which have 10 to 50% depositional material.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 4,800 to 5,500 feet
- B. Slope Gradient - 10 to 30%
- C. Slope Shape - Slopes are compound having broad weakly convex to flat ridgetops 100 to 300 feet wide. Sideslopes are convex both laterally and vertically with broad concave draws. Slope lengths range from 60 to 300 feet in length.
- D. Overall Relief - 100 to 300 feet
- E. Dissection Relief - 15 to 200 feet
- F. Stream Density - 4 to 8 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Dendritic

STREAM DENSITY: 1-5 miles/mile²
MEAN: 3.25 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (85%)

CHANNEL TYPE: Channel banks and beds are poorly defined and contain higher proportions of fine.

SLOPE WATER MOVEMENT: Water movement in draws and swales is subsurface with frequent springs, seeps, and bogs. Interfluvies are well drained with significant subsurface flows.

SEDIMENT DELIVERY: Moderate with good storage capacity.

OTHER IMPORTANT CHARACTERISTICS: Streams are sensitive to increases in sediment and water yield, but such changes must usually be generated outside the unit. Water yield can be altered by vegetative management but it is regulated by the slopes.

PARENT MATERIAL GROUP

This group includes weathered granites and associated gneisses of the Idaho Batholith.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations above 4,800 feet on all aspect slopes. Soil profiles are 60+ inches deep. Well drained ridge soils have a volcanic ash surface 7 to 20 inches thick. Poorly drained draw soils have a darkened modified volcanic ash surface 5 to 12 inches thick. Subsurface soil is medium to coarse textured with 20 to 40% rock fragments. Naturally dense fragipan layers may occur in draws resulting in perched water.

TYPICAL SOIL PROFILES

(Well drained soil)

Surface Soil - 0 to 14" dark brown silt loam, weak granular structure, nonsticky, nonplastic (range 7 to 20" thick).

Subsoil - 14 to 30" brown sandy loam, weak subangular blocky structure, nonsticky, nonplastic, 25 to 40% rock fragments (range 6 to 22" thick).

Substratum - 30 to 60"+ pale brown sandy loam, structureless, nonsticky, nonplastic, 25 to 50% rock fragments.

(Poorly drained soil)

Surface Soil - 0 to 8" very dark brown silt loam with weak subangular blocky structure, nonsticky, nonplastic, (range 5 to 12" thick).

Subsoil - 8 to 22" dark greyish brown gravelly silt loam with weak subangular blocky structure, nonsticky, nonplastic, 20 to 50% rock fragments, (range 10 to 30" thick).*

Parent Material - 22 to 60"+ pale brown gravelly sandy loam, structureless, nonsticky, nonplastic, 20 to 40% rock fragments.*

*NOTE: These horizons may have a naturally dense (fragipan) characteristic which can cause perching of water, resulting in poor drainage.

SOIL CLASSIFICATION - Entic Cryandepts, medial/loamy - skeletal, mixed and Typic Cryumbrepts, medial/loamy - skeletal, mixed.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Ash caps on well drained soils may contain a 2 to 5 inch A1 horizon. Ash caps may be thin and mixed on ridgetops and points. Weakly expressed alfisols may occur in moist draws.

VEGETATIVE CHARACTERISTICS - The dominant habitat type on well drained ridges is subalpine fir/pachistima (ABLA/PAMY). Poorly drained draws have alder, ferns, and sedges.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretation ratings are low to moderate.

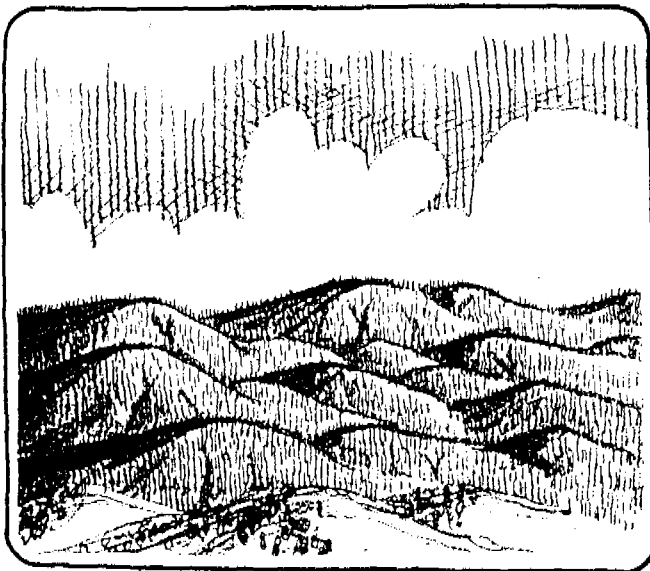
ENGINEERING - Most engineering problems are associated with wet draws in this landtype. Cutbank sloughing, dry cutbank raveling, and rapid brush encroachment are common maintenance problems.

SILVICULTURE - Regeneration limitations for this landtype are related to severe brush competition, high water tables and dark colored umbric soils, all of which are dominant in wet draw areas. Soil compaction potential is also rated high in wet parts of this unit. Ridges and other well drained portions of this landtype have few silvicultural limitations.

POTENTIAL WILDLIFE HABITAT - This landtype has properties such as food, water, cover and vegetative diversity which are important components of wildlife habitat. Because of the high elevation, this landtype is inaccessible in the winter and has high potential primarily as summer range.



LANDTYPE 22-K00



SUMMARY

Number of map delineations - 56
Total acreage - 3,800
Average map unit acreage - 68

These units are located on low elevation, low relief rolling hills and uplands. Soils are deep, well drained and developed in grussic granitic parent material. The habitat type is western red cedar/pachistima.

LANDFORM 22-LOW RELIEF HILLS

Overall relief consists of gently rolling, low relief hills and uplands. Drainage patterns are dense and well developed with concave draws which have 10 to 50% depositional material.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 2,600 to 4,800 feet
- B. Slope Gradient - 10 to 30%
- C. Slope Shape - Slopes are compound having broad weakly convex to flat ridgetops 100 to 300 feet wide. Sideslopes are convex both laterally and vertically with broad concave draws. Slope lengths range from 60 to 300 feet in length.
- D. Overall Relief - 100 to 300 feet
- E. Dissection Relief - 15 to 200 feet
- F. Dissection Density - 30 to 40 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Dendritic

STREAM DENSITY: 1-5 miles/mile²
MEAN: 3.25 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (85%)

CHANNEL TYPE: Moderate to high width/depth ratio; pool-run complex; gravel beds; lateral development, some meandering.

SLOPE WATER MOVEMENT: Generally subsurface with deep percolation. Streams head low on slopes. Water yield is very well regulated.

SEDIMENT DELIVERY: Low to moderate with good storage capacity; sediment and debris accumulate for several years and then are infrequently discharged as impulse loading to lower parts of the system.

OTHER IMPORTANT CHARACTERISTICS: Channels are extremely sensitive to changes in water yields or sediment loadings. Water yields can be significantly increased by vegetative management, but the nature of slopes moderates runoff throughout the year.

PARENT MATERIAL GROUP

This group includes deeply weathered grussic granitics of the Idaho Batholith. Ash material lies directly over decomposed granitic material which has very little soil development and is relatively impermeable.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,800 feet on all aspects. Soil profiles are 60+ inches deep. Surface soil is volcanic ash 8 to 22 inches thick. Subsurface soil is coarse textured with 20 to 50% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 14" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 8 to 22" thick).

Subsoil - 14 to 25" brown gravelly sandy loam or loamy sand with weak subangular blocky structure, nonsticky, nonplastic, 20 to 50% gravel (5 to 15" thick).

Substratum - 25 to 60"+ pale brown gravelly loamy sand, structureless, nonsticky, nonplastic, 20 to 50% gravel.

SOIL CLASSIFICATION - Typic Vitrandetps, medial/sandy, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Major soil variations are depth and amount of mixing of the ash cap. Soils with thick loamy IIB2 horizons may occur in moist draws. Grain size of the weathered granitics influence whether or not the soil is classified as skeletal. Soils with thin mixed ash caps occur on ridgetops and points.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is western red cedar/pachistima (THPL/PAMY). Grand-fir/pachistima (GF/PAMY) may occur on ridgetop soils which have thin ash caps.

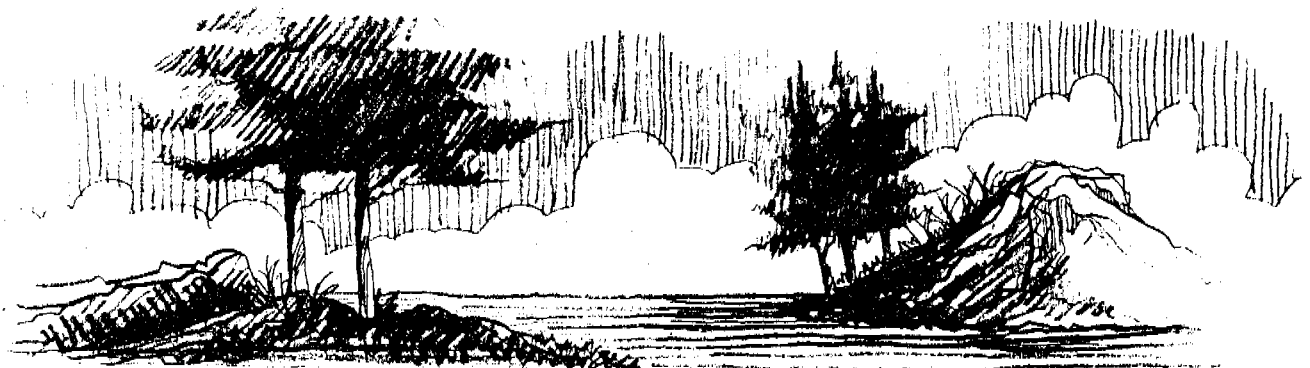
MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a very high parent material erosion and a high subsoil erosion potential. Exposed subsurface soils on roads and skid trails are subject to severe erosion. A major watershed objective should be to prevent eroded material from reaching stream courses.

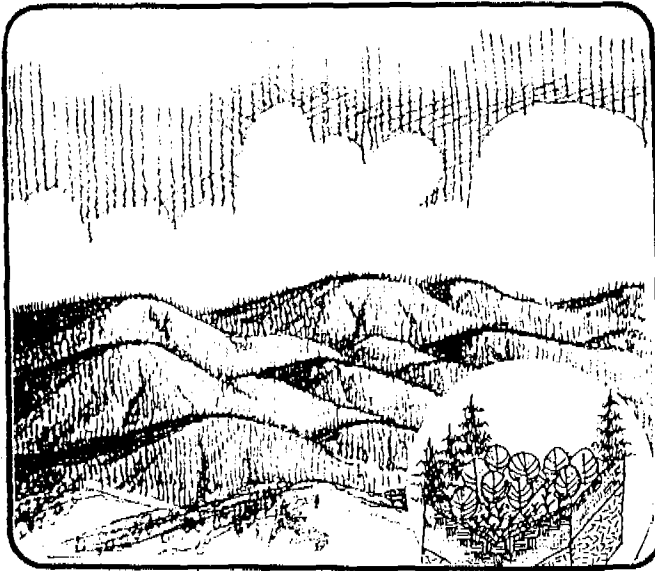
ENGINEERING - Potential road construction problems include very high parent material erosion and high subsoil erosion rates in the excavated road prism. Dry cutbank raveling commonly requires maintenance. Cut and fill slopes are especially difficult to revegetate. Seeding, fertilizing, and mulching operations on cut and fill slopes are often unsuccessful.

SILVICULTURE - The volcanic ash topsoil is critical to the productivity of this landtype, and mechanical operations should avoid removal or displacement of this layer. Much of the nutrient status and moisture holding capacity of this soil is within the ash.

POTENTIAL WILDLIFE HABITAT - This landtype is rated as having moderate potential for summer habitat. Where elevations are low enough to be accessible during periods of snow accumulation, winter habitat is rated moderate.



LANDTYPE 22-K45



SUMMARY

Number of map delineations - 63
Total acreage - 12,600
Average map unit acreage - 200

These units are located on low elevation, low relief rolling hills and uplands. Soils are well drained on ridges, poorly drained in draws, and have deep profiles developed in gneissic granitic parent material. The habitat type is western red cedar/pachistima with riparian vegetation in wet draws.

LANDFORM 22-LOWRELIEF HILLS

Overall relief consists of gently rolling, low relief hills and uplands. Drainage patterns are dense and well developed with concave draws which have 10 to 50% depositional material.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 2,600 to 5,000 feet
- B. Slope Gradient - 10 to 30%
- C. Slope Shape - Slopes are compound having broad weakly convex to flat ridgetops 100 to 300 feet wide. Sideslopes are convex both laterally and vertically with broad concave draws. Slope lengths range from 60 to 300 feet in length.
- D. Overall Relief - 100 to 300 feet
- E. Dissection Relief - 15 to 200 feet
- F. Dissection Density - 30 to 40 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Dendritic

STREAM DENSITY: 1-5 miles/mile²
MEAN: 3.25 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (85%)

CHANNEL TYPE: Channel banks and beds are poorly defined and contain higher proportions of fine.

SLOPE WATER MOVEMENT: Water movement in draws and swales is subsurface with frequent springs, seeps, and bogs. Interfluvies are well drained with significant subsurface flows.

SEDIMENT DELIVERY: Moderate with good storage capacity.

OTHER IMPORTANT CHARACTERISTICS: Streams are sensitive to increases in sediment and water yield, but such changes must usually be generated outside the unit. Water yield can be altered by vegetative management but it is regulated by the slopes.

PARENT MATERIAL GROUP

This group includes deeply weathered gneissic granitics of the Idaho Batholith. Ash material lies directly over decomposed granitic material which has very little soil development and is relatively impermeable.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 5,000 feet on all aspect slopes. Soil profiles are 50+ inches deep. Well drained ridge soils have a volcanic ash surface 8 to 24 inches thick. Poorly drained draw soils have a darkened modified volcanic ash surface 6 to 15 inches thick. Subsurface soil is coarse textured with 10 to 35% rock fragments. Naturally dense fragipan layers may occur in wet draws.

TYPICAL SOIL PROFILES

(Well drained soil)

Surface Soil - 0 to 14" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 8 to 24" thick).

Subsoil - 14 to 30" brown gravelly loamy sand with weak subangular blocky structure, nonsticky, nonplastic, 10 to 30% gravels (10 to 22" thick).

Substratum - 30 to 50"+ light brown gravelly loamy sand, structureless, nonsticky, nonplastic, 10 to 50% gravels.

(Poorly drained soil)

Surface Soil - 0 to 12" very dark brown silt loam with weak subangular blocky structure, nonsticky, nonplastic, (range 6 to 15" thick).

Subsoil - 12 to 25" dark greyish brown gravelly sandy loam, weak subangular blocky structure, nonsticky, nonplastic, 10 to 30% gravels (range 15 to 30" thick).*

Substratum - 25 to 50"+ pale brown gravelly loamy sand, structureless, nonsticky, nonplastic, 20 to 35% gravels.*

*NOTE: These horizons may have a naturally dense (fragipan) layer which may cause perching of water and poor drainage.

SOIL CLASSIFICATION - Typic Vitrandepts, medial/sandy, mixed, frigid, and Typic Haplumbrepts, medial/sandy, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Well drained soils occur on ridges and interflaves with both western red cedar and subalpine fir habitat types. Major variations are the depth and degree of mixing of the ash caps, with thinner mixed ash caps occurring on ridgetops and points. The wet and moist soils in draws may or may not have fragipans. Because of small number of mapping units and the narrow elevation range, the western red cedar and subalpine fir habitat types are combined. Size of sand grains determines skeletal classification.

VEGETATIVE CHARACTERISTICS - The dominant habitat type on well drained ridges is western red cedar/pachistima (THPL/PAMY). Poorly drained draws have alder, fern, and sedge vegetation surrounded by cedar.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a high subsoil and a very high parent material erosion potential. Because of this highly erosive characteristic, skidding, site preparation, and slash disposal operations should avoid removal or displacement of the volcanic ash topsoil. A major watershed objective should be to minimize the movement of eroded material into drainages.

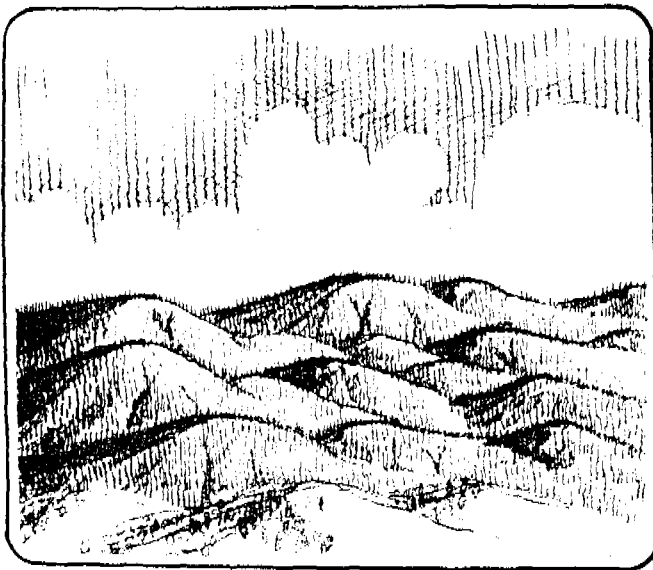
ENGINEERING - Potential road construction problems in this unit are associated with wet draws, including very high parent material erosion and high subsoil erosion rates in the excavated road prism. Dry cutbank raveling commonly requires maintenance. Cut and fill slopes are especially difficult to revegetate. Seeding, fertilizing, and mulching operations on cut and fill slopes are often unsuccessful.

SILVICULTURE - The volcanic ash topsoil is critical to the productivity of this landtype, and mechanical operations should avoid removal or displacement of this layer. Much of the nutrient status and moisture holding capacity of this soil is within the ash. Historically, dark colored (umbric) soils of this landtype have supported clumpy timber and are difficult to regenerate because of high water tables and severe fern or brush competition.

POTENTIAL WILDLIFE HABITAT - This landtype has important properties associated with potential habitat including food, water, cover, and vegetative diversity. Alder draws and wet brushy areas provide potential habitat for elk, deer, and small fur bearers. This landtype is rated high for summer habitat because of diversity, and high for winter range at lower elevations where snow depths do not limit accessibility.



LANDTYPE 22-000



SUMMARY

Number of map delineations - 64
Total acreage - 5,800
Average map unit acreage - 91

These units are located on low elevation, low relief rolling hills and uplands on the west end of the Forest. Soils are deep, well drained, and developed in quartzitic and siltite parent material. The habitat type is western red cedar or western hemlock/pachistima.

LANDFORM 22-LOW RELIEF HILLS

Overall relief consists of gently rolling, low relief hills and uplands. Drainage patterns are dense and well developed with concave draws which have 10 to 50% depositional material.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 2,600 to 4,900 feet
- B. Slope Gradient - 10 to 30%
- C. Slope Shape - Slopes are compound having broad weakly convex to flat ridgetops 100 to 300 feet wide. Sideslopes are convex both laterally and vertically with broad concave draws. Slope lengths range from 60 to 300 feet in length.
- D. Overall Relief - 100 to 300 feet
- E. Dissection Relief - 15 to 200 feet
- F. Dissection Density - 30 to 40 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Dendritic

STREAM DENSITY: 1-5 miles/mile²
MEAN: 3.25 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (85%)

CHANNEL TYPE: Moderate to high width/depth ratio; pool-run complex; gravel beds; lateral development, some meandering.

SLOPE WATER MOVEMENT: Generally subsurface with deep percolation. Streams head low on slopes. Water yield is very well regulated.

SEDIMENT DELIVERY: Low to moderate with good storage capacity; sediment and debris accumulate for several years and then are infrequently discharged as impulse loading to lower parts of the system.

OTHER IMPORTANT CHARACTERISTICS: Channels are extremely sensitive to changes in water yields or sediment loadings. Water yields can be significantly increased by vegetative management, but the nature of slopes moderates runoff throughout the year.

PARENT MATERIAL GROUP

This group includes deeply weathered Libby siltite, Revett quartzite, and Wallace gneiss, all in the Belt Supergroup of metasediments. Layers of Palouse loess and Mazama volcanic ash occur on the surface.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,900 feet on all aspects. Soil profiles are 60+ inches deep and well drained. Surface soil is volcanic ash 7 to 28" thick. The subsurface soil is medium to coarse textured with 5 to 25% rock fragments. The soil is derived from highly weathered bedrock.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 17" dark brown silt loam with weak granular structure, very friable, slightly sticky, slightly plastic, (range 7 to 28" thick).

Subsoil - 17 to 35" dark yellowish brown silt loam to fine sandy loam with subangular blocky structure, friable, nonsticky, nonplastic with 25% rock fragments, (range 15 to 40" thick).

Substratum - 35 to 55"+ brown sandy loam, structureless, friable, nonsticky, nonplastic, 10% rock fragments.

SOIL CLASSIFICATION - Typic Vitrandepts, medial/loamy, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Most soil variation in this landtype is in the depth of the volcanic ash cap, rock fragments in the subsoil, and degree of weathering of the parent material. Some soils on south slopes are much drier, usually have less than 7" volcanic ash, and support grand fir habitat types. Some soils on very gentle slopes have clay accumulation in the subsoil to form water restrictive layers. Wet soils occur along drainages and in concave areas. The soils with thinner ash caps tend to occur on southerly slopes or strongly convex positions.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is western red cedar/pachistima with western hemlock occurring in the west end of the Palouse District. Some steep south facing slopes with thin soils support grand fir habitat types.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect low potential hazard ratings.

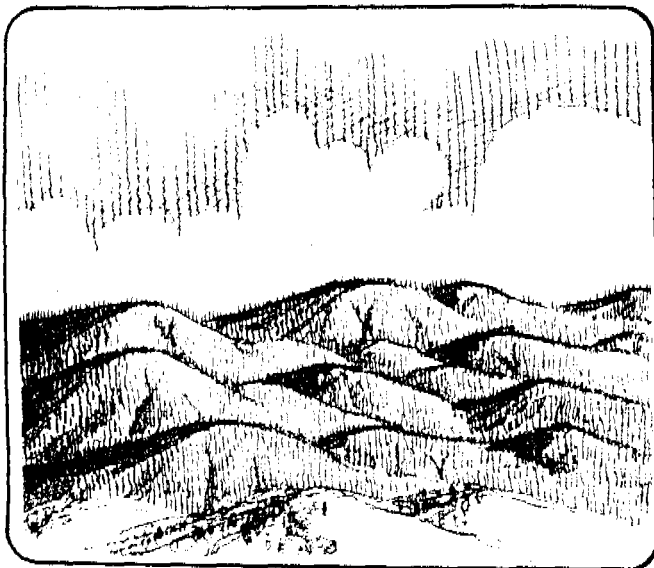
ENGINEERING - No significant engineering problems or maintenance needs are associated with this landtype.

SILVICULTURE - This landtype has no major silvicultural limitations.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate in potential for summer habitat. Winter range potential is rated moderate at low elevations where snow accumulation does not limit access.



LANDTYPE 22-Q01



SUMMARY

Number of map delineations - 76
Total acreage - 9,500
Average map unit acreage - 125

These units are located on low elevation, low relief rolling hills and uplands on the west end of the Forest (Palouse District). Soils are deep, moderately well to well drained, and developed in quartzite and siltite parent material. The habitat type is western red cedar or western hemlock/pachistima.

LANDFORM 22-LOW RELIEF HILLS

Overall relief consists of gently rolling, low relief hills and uplands. Drainage patterns are dense and well developed with concave draws which have 10 to 50% depositional material.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 2,600 to 4,000 feet
- B. Slope Gradient - 10 to 30%
- C. Slope Shape - Slopes are compound having broad weakly convex to flat ridgetops 100 to 300 feet wide. Sideslopes are convex both laterally and vertically with broad concave draws. Slope lengths range from 60 to 300 feet in length.
- D. Overall Relief - 100 to 300 feet
- E. Dissection Relief - 15 to 200 feet
- F. Dissection Density - 30 to 40 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Dendritic

STREAM DENSITY: 1-5 miles/mile²
MEAN: 3.25 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (85%)

CHANNEL TYPE: Moderate to high width/depth ratio; pool-run complex; gravel beds; lateral development, some meandering.

SLOPE WATER MOVEMENT: Generally subsurface with deep percolation. Streams head low on slopes. Water yield is very well regulated.

SEDIMENT DELIVERY: Low to moderate with good storage capacity; sediment and debris accumulate for several years and then are infrequently discharged as impulse loading to lower parts of the system.

OTHER IMPORTANT CHARACTERISTICS: Channels are extremely sensitive to changes in water yields or sediment loadings. Water yields can be significantly increased by vegetative management, but the nature of slopes moderates runoff throughout the year.

PARENT MATERIAL GROUP

This group includes deeply weathered Libby siltite, Revett quartzite, and Wallace gneiss, all of the Belt Supergroup of metasediments.

1/2

SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,000 feet on all aspects. Soil profiles are 60+ inches deep and are moderately well to well drained. The surface soil is volcanic ash 7 to 28 inches thick. The subsoil varies from coarse textured with 5 to 25% rock fragments to fine textured with horizons of clay accumulation.

TYPICAL SOIL PROFILES

Surface Soil - 0 to 17" dark brown silt loam with weak granular structure, very friable, slightly sticky, slightly plastic, (range 7 to 28" thick).

Subsoil - 17 to 35" dark yellowish brown silt loam - fine sandy loam with subangular blocky structure, friable, nonsticky, nonplastic with 25% rock fragments. (range 15 to 40" thick).

Substratum - 35 to 55"+ brown sandy loam, structureless, friable, nonsticky, nonplastic, 10% rock fragments.

SOIL CLASSIFICATION - Typic Vitrandepts, medial/loamy, mixed, frigid.

Surface Soil - 0 to 16" brown silt loam volcanic ash with granular structure, very friable, slightly sticky and slightly plastic, (range 7 to 28" thick).

Subsoil (1) - 16 to 43" dark yellowish brown silt loam with subangular blocky structure, (range 10 to 35" thick).

Subsoil (2) - 43 to 55"+ brown to reddish brown heavy silt loam with subangular blocky structure, very firm, sticky, plastic, and clay film lining pores and ped faces.

Substratum - The subsoil horizon of clay accumulation grades into highly decomposed bedrock material with clay bridging the sand grains.

SOIL CLASSIFICATION - Andeptic Paleboralf, medial/loamy, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - The soils with clay accumulation in the subsoils occur on gentle ridgetops and sideslopes while the less well developed soils occur on the steeper more convex topography. In some places, the soils with clay accumulation are cemented into fragipans. Some very steep, south facing slopes lack volcanic ash may have more than 35% rock fragments, support grand fir habitat types. Wet soils occur along drainages and in low concave areas.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is western red cedar/pachistima (THPL/PAMY) with western hemlock (TSHE/PAMY) occurring on the west end of the Palouse District.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect low potential hazard ratings.

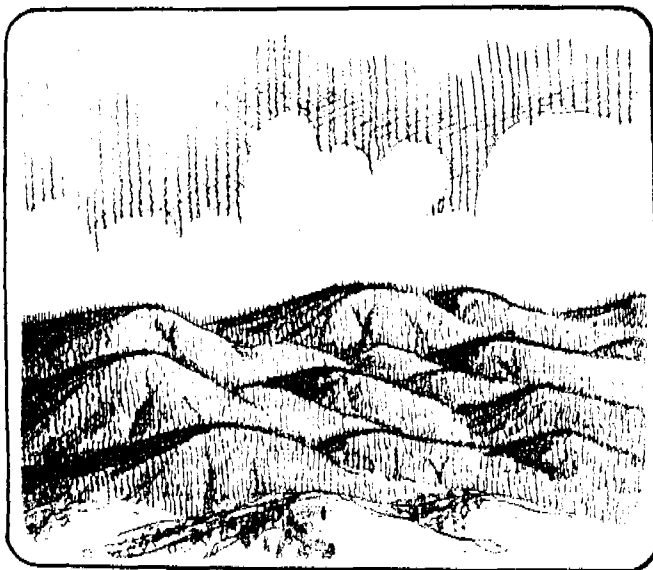
ENGINEERING - No significant engineering problems or maintenance needs are associated with this landtype.

SILVICULTURE - This landtype has no major silvicultural limitations.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate in potential for summer habitat. Winter range potential is rated moderate at low elevations where snow accumulation does not limit access.



LANDTYPE 22-S00



SUMMARY

Number of map delineations - 64
Total acreage - 9,600
Average map unit acreage - 150

These units are located on low elevation, low relief rolling hills and uplands. Soils are deep, well drained and are developed in micaceous schist parent material. The habitat type is western red cedar/pachistima.

LANDFORM 22-LOW RELIEF HILLS

Overall relief consists of gently rolling, low relief hills and uplands. Drainage patterns are dense and well developed with concave draws which have 10 to 50% depositional material.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 2,600 to 4,800 feet
- B. Slope Gradient - 10 to 30%
- C. Slope Shape - Slopes are compound having broad weakly convex to flat ridgetops 100 to 300 feet wide. Sideslopes are convex both laterally and vertically with broad concave draws. Slope lengths range from 60 to 300 feet in length.
- D. Overall Relief - 100 to 300 feet
- E. Dissection Relief - 15 to 200 feet
- F. Dissection Density - 30 to 40 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Dendritic

STREAM DENSITY: 1-5 miles/mile²
MEAN: 3.25 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (85%)

CHANNEL TYPE: Moderate to high width/depth ratio; pool-run complex; gravel beds; lateral development, some meandering.

SLOPE WATER MOVEMENT: Generally subsurface with deep percolation. Streams head low on slopes. Water yield is very well regulated.

SEDIMENT DELIVERY: Low to moderate with good storage capacity; sediment and debris accumulate for several years and then are infrequently discharged as impulse loading to lower parts of the system.

OTHER IMPORTANT CHARACTERISTICS: Channels are extremely sensitive to changes in water yields or sediment loadings. Water yields can be significantly increased by vegetative management, but the nature of slopes moderates runoff throughout the year.

PARENT MATERIAL GROUP

This group includes deeply weathered micaceous schists and gneisses with interbedded pegmatites of the Belt Supergroup, commonly referred to as high grade metamorphics of the Border Zone. The schists are usually high in quartz and mica. They tend to weather irregularly along bedding planes, creating internal weaknesses.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,800 feet on all aspect slopes. Soil profiles are 60+ inches deep. Surface soil is volcanic ash 7 to 26 inches thick. Subsurface soil is medium textured with weak clay accumulations and 5 to 30% rock fragments. Subsurface soils contain an estimated 10 to 20% mica.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 15" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 7 to 26" thick).

Subsoil - 15 to 30" brown micaceous sandy loam to loam with moderate subangular blocky structure, slightly sticky, slightly plastic with moderately thick clay films, 5 to 20% rock fragments, (range 10 to 24" thick).

Substratum - 30 to 60"+ yellowish brown micaceous sandy loam, structureless, nonsticky, nonplastic, 10 to 30% rock fragments.

SOIL CLASSIFICATION - Eutric Glossoboralfs, medial/loamy, mixed, frigid, and Typic Vitrandepts, medial/loamy, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Areas in this unit are derived from the St. Regis Formation, have well developed horizons of clay accumulation (argillic horizons) which are substantially finer texture than the typical soil (clay loam vs. loam). Other variations include ash surface thickness and rock fragment content of subsurface horizons. Subsoil textures tend to be finer in moist draws. Fragipans occur as inclusions in wetter draws. Ridgetops have thinner soils with higher rock fragment content which may be adjacent to bedrock outcrops. Ten to fifteen percent of the unit consists of fine textured alluvial soils described in Landtype 11-A47 and 22-A01. Soils with horizons of clay accumulation occur on smooth, gentle concave slopes with less developed soils on steeper slopes.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is western red cedar/pachistima (THPL/PAMY) with western red cedar/lady fern occurring in some moist sheltered draws. The Palouse District contains units with western hemlock/pachistima (TSHE/PAMY) vegetation.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect low to moderate ratings.

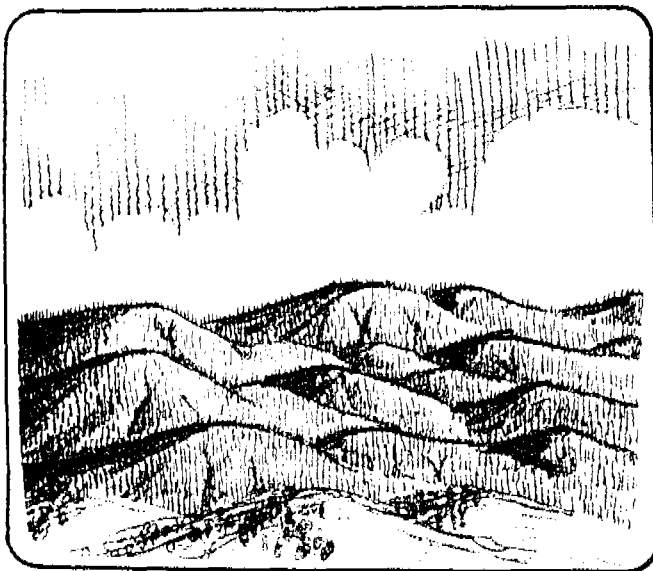
ENGINEERING - No significant road construction problems are associated with this landtype. Cutbank and fill sloughing are common maintenance problems. Subsoils have low bearing strengths and are subject to road tread rutting when wet.

SILVICULTURE - This is a highly productive landtype with few silvicultural limitations. Subsoils are fertile and have good moisture holding capacities. Subsoils are susceptible to compaction if the ash topsoil is removed.

POTENTIAL WILDLIFE HABITAT - This landtype is rated as having moderate potential for summer habitat. Where elevations are low enough to be accessible during periods of snow accumulation, winter habitat is rated moderate.



LANDTYPE 22-S01



SUMMARY

Number of map delineations - 16
Total acreage - 2,700
Average map unit acreage - 169

These units are located on low elevation, low relief rolling hills and uplands. Soils are deep, moderately well to well drained, and are developed in micaceous schist parent material. The habitat types are western red cedar and western hemlock/pachistima.

LANDFORM 22-LOW RELIEF HILLS

Overall relief consists of gently rolling, low relief hills and uplands. Drainage patterns are dense and well developed with concave draws which have 10 to 50% depositional material.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 2,600 to 4,200 feet
- B. Slope Gradient - 10 to 30%
- C. Slope Shape - Slopes are compound having broad weakly convex to flat ridgetops 100 to 300 feet wide. Sideslopes are convex both laterally and vertically with broad concave draws. Slope lengths range from 60 to 300 feet in length.
- D. Overall Relief - 100 to 300 feet
- E. Dissection Relief - 15 to 200 feet
- F. Dissections Density - 30 to 40 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Dendritic

STREAM DENSITY: 1-5 miles/mile²
MEAN: 3.25 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (85%)

CHANNEL TYPE: Moderate to high width/depth ratio; pool-run complex; gravel beds; lateral development, some meandering.

SLOPE WATER MOVEMENT: Generally subsurface with deep percolation. Streams head low on slopes. Water yield is very well regulated.

SEDIMENT DELIVERY: Low to moderate with good storage capacity; sediment and debris accumulate for several years and then are infrequently discharged as impulse loading to lower parts of the system.

OTHER IMPORTANT CHARACTERISTICS: Channels are extremely sensitive to changes in water yields or sediment loadings. Water yields can be significantly increased by vegetative management, but the nature of slopes moderates runoff throughout the year.

PARENT MATERIAL GROUP

The lithology of this landtype includes schists from the Belt Supergroup which are very high in quartz and mica. They tend to be irregularly weathered along bedding planes creating internal weakness.

SOIL-VEGETATIVE UNIT

This unit occurs on the west end (Palouse District) of the Forest below 4,200 feet elevation and on all aspects. Soil profiles are 60+ inches deep and range from moderately well to well drained. Surface soil is volcanic ash 7 to 26" deep. Subsurface soil is medium to coarse textured with some horizons of clay accumulation, with 5 to 30% rock fragments, and an estimated 5 to 10% mica content.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 16" brown silt loam (volcanic ash) with moderately granular structure, very friable, slightly sticky, slightly plastic, (range 7 to 26" thick).

Subsoil (1) - 16 to 28" yellowish brown to brown silt loam with moderate subangular blocky structure, slightly sticky, slightly plastic, (range 10 to 30" thick).

Subsoil (2) - 28 to 60"+ brown to reddish brown gravelly, micaceous loam with prismatic structure, slightly sticky and slightly plastic.

Substratum - The above horizon grades with depth into highly decomposed mica schist.

SOIL CLASSIFICATION - Typic Vitrandepts, medial/loamy, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Soils in this landtype are approximately 80% nonskeletal, and 20% skeletal.

VEGETATIVE CHARACTERISTICS - Habitat types are western red cedar/pachistima (THPL/PAMY) and western hemlock (TSHE/PAMY).

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect low to moderate potential hazard ratings.

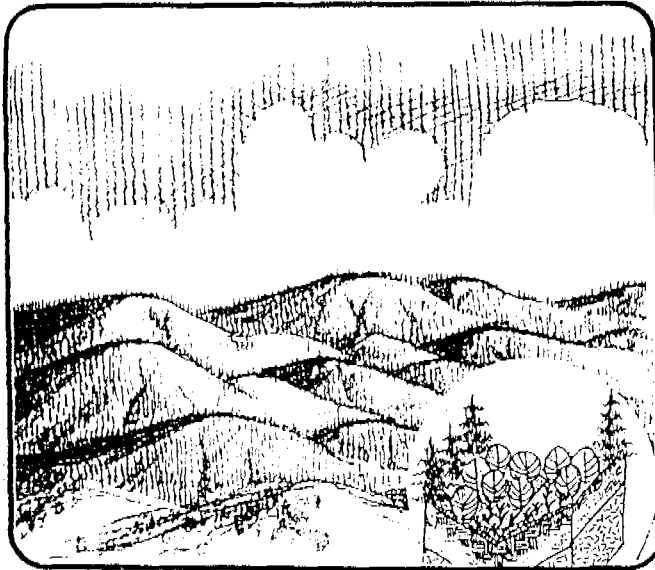
ENGINEERING - No significant road construction problems are associated with this landtype. Cutbank and fill sloughing are common maintenance problems. Subsoils have low bearing strengths and are subject to road tread rutting when wet.

SILVICULTURE - There are no major silvicultural limitations for this unit. Subsoils are subject to compaction if ash caps are removed.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate in potential for summer habitat. Winter range potential is rated moderate at low elevations where snow accumulation does not limit access.



LANDTYPE 22-S45



SUMMARY

Number of map delineations - 19
Total acreage - 5,900
Average map unit acreage - 311

These units are located on low elevation, low relief rolling hills and uplands. Soils are well drained on ridges, poorly drained in draws, and have deep profiles developed in micaceous schist parent material. The habitat type is western red cedar/pachistima with riparian vegetation in wet draws.

LANDFORM 22-LOWRELIEF HILLS

Overall relief consists of gently rolling, low relief hills and uplands. Drainage patterns are dense and well developed with concave draws which have 10 to 50% depositional material.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 2,600 to 4,800 feet
- B. Slope Gradient - 10 to 30%
- C. Slope Shape - Slopes are compound having broad weakly convex to flat ridgetops 100 to 300 feet wide. Sideslopes are convex both laterally and vertically with broad concave draws. Slope lengths range from 60 to 300 feet in length.
- D. Overall Relief - 100 to 300 feet
- E. Dissection Relief - 15 to 200 feet
- F. Dissection Density - 30 to 40 miles/mile²

DRAINAGE PATTERN: Dendritic

STREAM DENSITY: 1-5 miles/mile²
MEAN: 3.25 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (85%)

CHANNEL TYPE: Channel banks and beds are poorly defined and contain higher proportions of fine.

SLOPE WATER MOVEMENT: Water movement in draws and swales is subsurface with frequent springs, seeps, and bogs. Interfluvies are well drained with significant subsurface flows.

SEDIMENT DELIVERY: Moderate with good storage capacity.

OTHER IMPORTANT CHARACTERISTICS: Streams are sensitive to increases in sediment and water yield, but such changes must usually be generated outside the unit. Water yield can be altered by vegetative management but it is regulated by the slopes.

PARENT MATERIAL GROUP

This group includes moderately and well weathered schists and gneisses with interbedded pegmatites of the Belt Supergroup, commonly referred to as the high grade metamorphics of the Border Zone.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,800 feet on all aspect slopes. Soil profiles are 60+ inches deep. Well drained ridge soils have a volcanic ash surface 8 to 23 inches thick. Poorly drained soils have a modified volcanic ash surface 5 to 13 inches thick. Subsurface soil is medium to coarse textured with 10 to 40% rock fragments and an estimated 10 to 20% mica content.

TYPICAL SOIL PROFILES

(Well drained soil on ridges)

Surface Soil - 0 to 15" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 8 to 23" thick).

Subsoil - 15 to 35" brown gravelly sandy loam - loam with weak subangular blocky structure, slightly sticky, nonplastic, 10 to 35% rock fragments.

Substratum - 35 to 60"+ pale brown gravelly sandy loam, structureless, nonsticky, nonplastic, 10 to 40% rock fragments.

(Soils in draws)

Surface Soil - 0 to 7" very dark brown silt loam with weak subangular blocky structure, nonsticky, nonplastic, (range 5 to 13" thick).

Subsoil - 7 to 24" dark greyish brown loam with weak subangular blocky structure, sticky, nonplastic, 10 to 15% rock fragments, (range 15 to 31" thick).*

Substratum - 24 to 60"+ pale brown gravelly sandy loam, structureless, nonsticky, nonplastic, 20 to 30% rock fragments.*

*NOTE: These horizons may have a naturally dense (fragipan) characteristic which can cause perching of water, resulting in poor drainage.

SOIL CLASSIFICATION - Eutric Glossoboralfs, medial/loamy, mixed, frigid; Typic Vitrandepts, medial/loamy, mixed, frigid; and Andic Haplumbrepts, coarse-loamy, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Ash caps may vary in depth. Subsoils developed from schists are silt loam to loam textured and those weathered from gneiss are sandy loam in texture. Poorly drained soils occur in portions of draws.

VEGETATIVE CHARACTERISTICS - The dominant habitat type on well drained ridges is western red cedar/pachistima (THPL/PAMY). Draws have alder, fern, and sedge vegetation with scattered clumps of western red cedar.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect low to moderate potential hazard ratings. However, heavy equipment operations in wet draws can cause severe rutting and erosion into water courses.

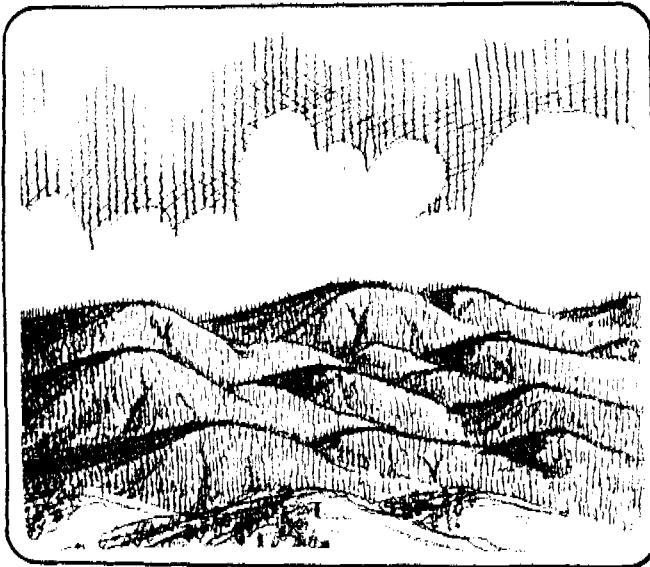
ENGINEERING - Road construction problems in this unit are associated with wet draws. Cutbank sloughing, fill slope sloughing, and rapid brush encroachment are common maintenance problems. Subsoils have low bearing strengths and are subject to rutting of road tread when wet.

SILVICULTURE - Well drained ridge soils are highly productive and have no major regeneration limitations. Draws have regeneration limitations related to severe brush competition, high water tables and dark colored umbric soils. Soil compaction is rated high in draw areas.

POTENTIAL WILDLIFE HABITAT - This landtype has important properties associated with potential habitat including food, water, cover, and vegetative diversity. Alder draws and wet brushy areas provide potential habitat for elk, deer, and small fur bearers. This landtype is rated high for summer habitat. Winter habitat is rated low because this unit does not generally occur at lower elevations which are accessible during periods of snow accumulation.



LANDTYPE 22-T01



SUMMARY

Number of map delineations - 17
Total acreage - 3,200
Average map unit acreage - 185

These units are located on low elevation, low relief, rolling hills on the highest remnant positions on top of the basalt plateau on the west end of the Forest. Soils are deep, well drained, and have developed in clayey materials related to basalt. The habitat type is western red cedar/pachistima.

LANDFORM 22-LOW RELIEF HILLS

Overall relief consists of gently rolling, low relief hills and uplands. Drainage patterns are dense and well developed with concave draws which have 10 to 50% depositional material.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 2,600 to 3,600 feet
- B. Slope Gradient - 10 to 30%
- C. Slope Shape - Slopes are compound having broad weakly convex to flat ridgetops 100 to 300 feet wide. Sideslopes are convex both laterally and vertically with broad concave draws. Slope lengths range from 60 to 300 feet in length.
- D. Overall Relief - 100 to 300 feet
- E. Dissection Relief - 15 to 200 feet
- F. Dissection Density - 30 to 40 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Dendritic

STREAM DENSITY: 1-5 miles/mile²
MEAN: 3.25 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (85%)

CHANNEL TYPE: Moderate to high width/depth ratio; pool-run complex; gravel beds; lateral development, some meandering.

SLOPE WATER MOVEMENT: Generally subsurface with deep percolation. Streams head low on slopes. Water yield is very well regulated.

SEDIMENT DELIVERY: Low to moderate with good storage capacity; sediment and debris accumulate for several years and then are infrequently discharged as impulse loading to lower parts of the system.

OTHER IMPORTANT CHARACTERISTICS: Channels are extremely sensitive to changes in water yields or sediment loadings. Water yields can be significantly increased by vegetative management, but the nature of slopes moderates runoff throughout the year.

PARENT MATERIAL GROUP

This group has not been clearly identified, but is thought to be made up of volcanic tuffs, breccias and palagonite. Other areas are evidently old surfaces and soils from another era which are rejuvenating. Some outcrops of competent Columbia River basalt occur in the units.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 3,600 feet on all aspects. Soil profiles are mostly 60+ inches deep, well drained, with 5 to 20 inches of volcanic ash on the surface. The subsoil is generally fine textured and weakly cemented, with 5 to 20% rock fragments. The soil is unique to the Swamp Creek area of the Palouse District and needs further study.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 12" dark brown gravelly silt loam with moderate granular structure, very friable, slightly sticky, slightly plastic, (range 5 to 20" thick).

Subsoil - 12 to 26" strong brown gravelly loam with medium subangular blocky structure, friable, slightly sticky, slightly plastic, (range 10 to 40" thick).

Substratum - 26 to 45"+ strong brown gravelly clay loam with massive structure, very firm, nonsticky, and nonplastic with 80% highly decomposed rock fragments.

SOIL CLASSIFICATION - Andic Dystrachrepts, fine-loamy, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Most of the soils in this landtype are finer textured than this profile. Color of the subsoil ranges from black to white to red. Concretions and highly decomposed basalt fragments are common. Some soils have less than 7 inches volcanic ash on the surface. Some have a layer of Palouse loess under the ash cap which, when deep enough, develops into soils with horizons of clay accumulation and fragipans. Soils along drainages and in concave areas may be wet. Narrow ridges and very steep slopes tend to have thinner soils with more than 35% rock fragments.

VEGETATIVE CHARACTERISTS - The dominant habitat type on this landtype is western red cedar/pachistima (THPL/PAMY).

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect low to moderate hazard ratings.

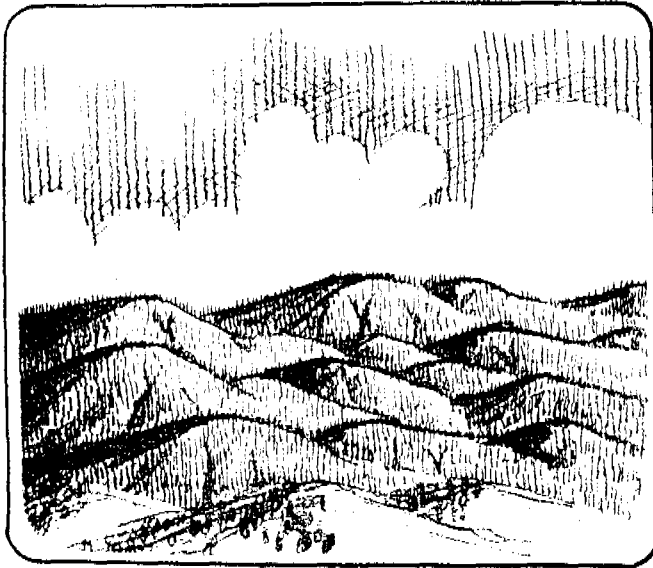
ENGINEERING - No significant road construction problems are associated with this landtype. Road tread erosion and rutting are common maintenance problems.

SILVICULTURE - This landtype may have regeneration limitations where the ash topsoil is less than 7 inches thick.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate in potential for summer habitat. Winter range potential is rated moderate at low elevations where snow accumulation does not limit access.



LANDTYPE 22-U25



SUMMARY

Number of map delineations - 13
Total acreage - 3,600
Average map unit acreage - 277

These units are located on low elevation, low relief rolling hills and uplands on south and west aspects on the west end of the Forest. Soils are deep, well drained, and developed from various parent material. The habitat type is grand fir/pachistima.

LANDFORM 22-LOWRELIEF HILLS

Overall relief consists of gently rolling, low relief hills and uplands. Drainage patterns are dense and well developed with concave draws which have 10 to 50% depositional material.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 2,600 to 4,000 feet
- B. Slope Gradient - 10 to 30%
- C. Slope Shape - Slopes are compound having broad weakly convex to flat ridgetops 100 to 300 feet wide. Sideslopes are convex both laterally and vertically with broad concave draws. Slope lengths range from 60 to 300 feet in length.
- D. Overall Relief - 100 to 300 feet
- E. Dissection Relief - 15 to 200 feet
- F. Dissection Density - 30 to 40 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Dendritic

STREAM DENSITY: 1-5 miles/mile²
MEAN: 3.25 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (85%)

CHANNEL TYPE: Moderate to high width/depth ratio; pool-run complex; gravel beds; lateral development, some meandering.

SLOPE WATER MOVEMENT: Generally subsurface with deep percolation. Streams head low on slopes. Water yield is very well regulated.

SEDIMENT DELIVERY: Low to moderate with good storage capacity; sediment and debris accumulate for several years and then are infrequently discharged as impulse loading to lower parts of the system.

OTHER IMPORTANT CHARACTERISTICS: Channels are extremely sensitive to changes in water yields or sediment loadings. Water yields can be significantly increased by vegetative management, but the nature of slopes moderates runoff throughout the year.

PARENT MATERIAL GROUP

This group has various lithologies including quartzite, siltite, gneiss, schist, and granitics, all of which are moderately to well weathered. The surface is influenced by Palouse loess and Mazama volcanic ash.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,000 feet on south and west slopes facing the Palouse Prairie. Soil profiles are mostly 60+ inches deep, well drained, with Palouse loess on the surface. The subsoil is generally medium textured with 5 to 25% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 8" brown to dark brown silt loam with granular to subangular blocky structure, friable, slightly sticky, slightly plastic, (range 5 to 15" thick).

Subsoil - 8 to 33" dark brown heavy silt loam with moderate subangular blocky structure, firm, slightly sticky, slightly plastic with thin clay films on ped faces and lining pores, (range 10 to 40" thick).

Substratum - 33 to 50"+ light yellowish brown very gravelly silt loam, massive, very firm, slightly sticky and slightly plastic with 20 to 50% siltite gravels.

SOIL CLASSIFICATION - Ultic Haploxeralf, coarse-silty, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - This soil and similar soils occur on about 70 to 80% of the unit. Similar soils are those with thin ash caps, some with distinct horizon of clay removal above the horizon of clay accumulation, and sandier soils developed from coarser bedrock types. Contrasting inclusions are soils on steep slopes without horizons of clay accumulation and more rock fragments, soils on north and east microsities with volcanic ash caps and western red cedar habitat types, some soils with cemented horizons (fragipans) on terraces and very gentle slopes, and wet soils along drainages.

VEGETATIVE CHARACTERISTICS - This unit is dominantly grand fir/pachistima, although it has inclusions of western red cedar/pachistima on north and east facing microsities, and western hemlock/pachistima along drainages on the west end of the Palouse District.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect low to moderate potential hazard ratings.

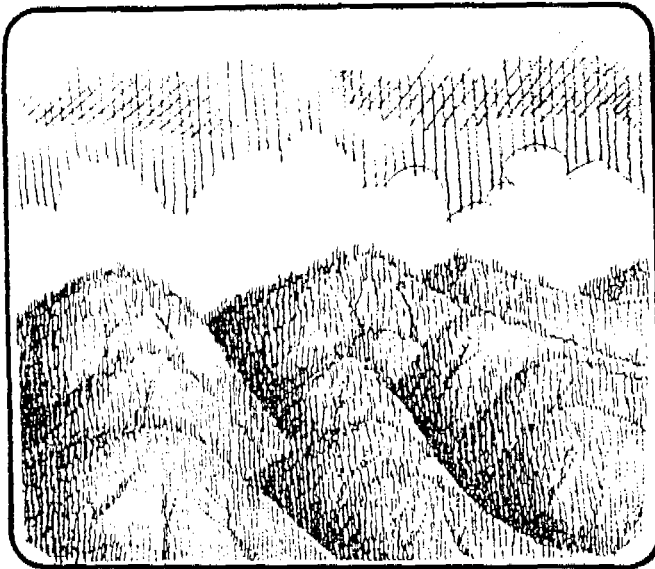
ENGINEERING - No significant road construction problems are associated with this landtype. Road tread erosion and rutting are common maintenance problems.

SILVICULTURE - This landtype has regeneration limitations related to the mixed or shallow ash surface soil and brush competition.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate in potential for summer habitat. Winter range potential is rated moderate at low elevations where snow accumulation does not limit access.



LANDTYPE 23-G20



SUMMARY

Number of map delineations - 29
Total acreage - 3,800
Average map unit acreage - 131

These units are located on low elevation, warm aspect, strongly dissected moderate relief rolling uplands. Soils are deep, well drained and are developed in a granitic parent material. The habitat type is western red cedar/pachistima.

LANDFORM 23- STRONGLY DISSECTED ROLLING UPLANDS

Overall relief consists of rounded ridges with narrow, sharply dissected V-shaped draws. This landform is characteristic of old surfaces which are being actively downcut by major drainages.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Ranges - 2,000 to 4,800 feet
- B. Slope Gradient - Varies from 15 to 30% on ridges to greater than 50% on sideslopes of V-shaped dissections.
- C. Slope Shapes - Rounded ridgetops 30 to 200 feet wide and steep straight sideslopes with narrow V-shaped draws.
- D. Overall Relief - 200 to 600 feet
- E. Dissection Relief - 100 to 350 feet
- F. Dissection Density - 20 to 30 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Dendritic

STREAM DENSITY: 3-9 miles/mile²
MEAN: 7 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (95%)

CHANNEL TYPE: Stable and well entrenched; low width/depth ratios; moderate gradient pool-riffle complex with gravel and cobble substrate.

SLOPE WATER MOVEMENT: Primarily subsurface on upper slopes, surface water increasing rapidly on breaks into larger streams. Water yield moderate and somewhat regulated.

OTHER IMPORTANT CHARACTERISTICS: Vegetative management can significantly effect water yields.

PARENT MATERIAL GROUP

This group includes granitics and associated gneisses of the Idaho Batholith. Parent materials on ridgetops are deeply weathered with moderate weathering on sideslopes.



7-60

SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,800 feet. Soil profiles are 60+ inches deep. Surface soil is volcanic ash 10 to 24 inches thick. Subsurface soil is coarse textured with 10 to 50% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 16" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 10 to 24" thick).

Subsoil - 16 to 36" brown gravelly sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 10 to 40% rock fragments, (range 10 to 40" thick).

Substratum - 36 to 60+" pale brown gravelly sandy loam, structureless, nonsticky, nonplastic, 10 to 50% rock fragments.

SOIL CLASSIFICATION - Typic Vitrandepts, medial/loamy, mixed, frigid, and Andic Dystrachrepts, coarse-loamy, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Ash caps are mixed and more variable in depth on the steep sideslopes but are more uniform on ridgetops. Soils on sideslopes are both skeletal and nonskeletal. Thinner soils are associated with rock outcrops and ridge points.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is western red cedar/pachistima (THPL/PAMY) with grand fir/pachistima (GF/PAMY) on ridgetops and steep southerly slopes.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a high sediment delivery efficiency. High dissection density and degree of dissection contribute to high sediment delivery efficiencies.

ENGINEERING - Potential road construction problems include high sediment delivery efficiencies associated with high dissection densities and steep dissection slopes. Road crossings on slope breaks between ridgetops and sideslopes require careful location because of zones of mass instability. Dry cutbank raveling is a common maintenance problem.

SILVICULTURE - This landtype has regeneration limitations because of high insolation rates on short steep southerly slopes.

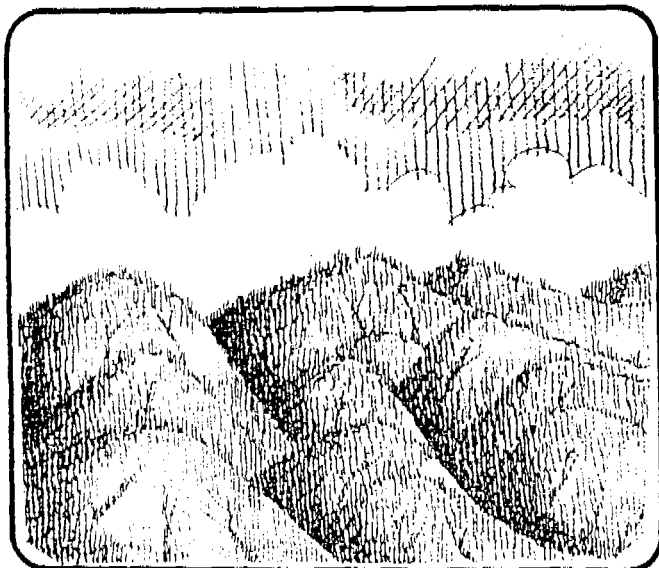
POTENTIAL WILDLIFE HABITAT - This landtype is rated as having moderate potential for summer habitat. Where elevations are low enough to be accessible during periods of snow accumulation, winter habitat potential is rated moderate.



II-61

1/83

LANDTYPE 23-K20



SUMMARY

Number of map delineations - 8
Total acreage - 800
Average map unit acreage - 100

These units are located on low elevation, warm aspect, strongly dissected moderate relief rolling uplands. Soils are deep, well drained, and developed in gneissic granitic parent material. The habitat type is western red cedar/pachistima.

LANDFORM 23- STRONGLY DISSECTED ROLLING UPLANDS

Overall relief consists of rounded ridges with narrow, sharply dissected V-shaped draws. This landform is characteristic of old surfaces which are being actively downcut by major drainages.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Ranges - 2,000 to 4,800 feet
- B. Slope Gradient - Varies from 15 to 30% on ridges to greater than 50% on the V-shaped sideslopes.
- C. Slope Shapes - Rounded ridgetops 30 to 200 feet wide and steep straight sideslopes with narrow V-shaped draws.
- D. Overall Relief - 200 to 600 feet
- E. Dissection Relief - 100 to 350 feet
- F. Dissection Density - 20 to 30 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Dendritic

STREAM DENSITY: 3-9 miles/mile²
MEAN: 7 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (95%)

CHANNEL TYPE: Stable and well entrenched; low width/depth ratios; moderate gradient pool-riffle complex with gravel and cobble substrate.

SLOPE WATER MOVEMENT: Primarily subsurface on upper slopes, surface water increasing rapidly on breaks into larger streams. Water yield moderate and somewhat regulated.

OTHER IMPORTANT CHARACTERISTICS: Vegetative management can significantly effect water yields.

PARENT MATERIAL GROUP

This group includes deeply weathered gneissic granitics of the Idaho Batholith. Ash material lies directly over decomposed granitic material with very little soil development and is relatively impermeable.



SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,800 feet on high energy slopes. Soil profiles are 60+ inches deep. Surface soil is volcanic ash 6 to 22 inches thick. Subsurface soil is coarse textured with 20 to 50% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil 0 to 13" dark brown silt loam with weak granular structure, nonsticky nonplastic, (range 7 to 22" thick).

Subsoil - 14 to 25" brown gravelly sandy loam or loamy sand with weak subangular blocky structure, nonsticky, nonplastic, 30 to 50% gravels (5 to 15" thick).

Substratum - 25 to 60"+ pale brown gravelly loamy sand, structureless, nonsticky, nonplastic, 40 to 60% gravels.

SOIL CLASSIFICATION - Andic Dystrochrepts, sandy-skeletal, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Major soil variations are depth and amount of mixing of the ash cap. Ash caps tend to be more mixed and somewhat thinner on steep colluvial slopes. Soils with thick loamy IIB2 horizons may occur in moist draws. Grain size of the weathered granitics influence whether or not the soil is classified as skeletal.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is western red cedar/pachistima (THPL/PAMY). Grand fir/pachistima (GF/PAMY) occupies ridgetops and steep south slopes.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a very high parent material erosion potential with high ratings for subsoil erosion potential, and slope sediment delivery efficiency. Exposed subsurface soils on roads and skid trails are subject to severe erosion. A major watershed objective should be to prevent eroded material from reaching stream courses.

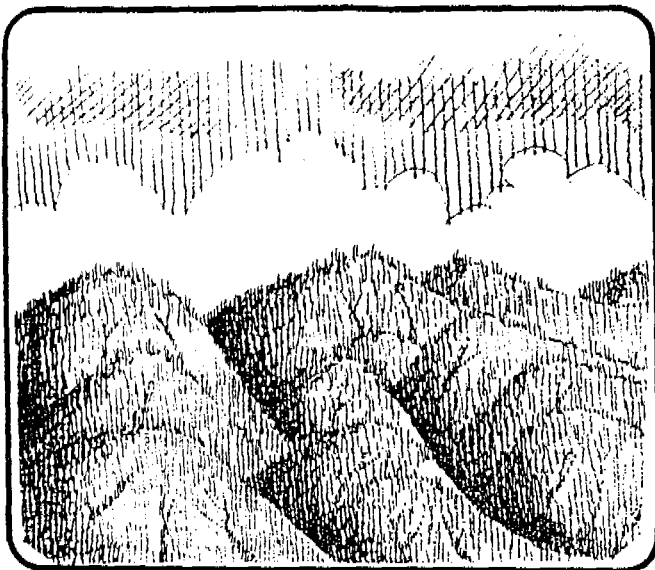
ENGINEERING - Potential engineering problems include very high parent material erosion in the excavated road prism. Sediment generated is efficiently delivered to streams due to high dissection density and steep slopes. Dry cutbank raveling and cut and fill erosion are common maintenance problems. Seeding, fertilizing, and mulching operations are often unsuccessful.

SILVICULTURE - The volcanic ash topsoil is critical to the productivity of this landtype, and mechanical operations should avoid removal or displacement of this surface layer. Much of the nutrient status and moisture holding capacity of this soil is contained within the ash. High slope insulation rates are problems on short steep southerly slopes.

POTENTIAL WILDLIFE HABITAT - This landtype is rated as having moderate potential for summer habitat. Where elevations are low enough to be accessible during periods of snow accumulation, winter habitat is rated moderate.



LANDTYPE 23-S20



SUMMARY

Number of map delineations - 11
Total acreage - 300
Average map unit acreage - 27

These units are located on low elevation, warm aspect, strongly dissected moderate relief rolling uplands. Soils are deep, well drained and are developed in micaceous schist parent material. The habitat type is western red cedar/pachistima.

LANDFORM 23- STRONGLY DISSECTED ROLLING UPLANDS

Overall relief consists of rounded ridges with narrow, sharply dissected V-shaped draws. This landform is characteristic of old surfaces which are being actively downcut by major drainages.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Ranges - 2,000 to 4,800 feet
- B. Slope Gradient - Varies from 15 to 30% on ridges to greater than 50% on sideslopes of V-shaped dissections.
- C. Slope Shapes - Rounded ridgetops 30 to 200 feet wide and steep straight sideslopes with narrow V-shaped draws.
- D. Overall Relief - 200 to 600 feet
- E. Dissection Relief - 100 to 350 feet
- F. Dissection Density - 20 to 30 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Dendritic

STREAM DENSITY: 3-9 miles/mile²
MEAN: 7 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (95%)

CHANNEL TYPE: Stable and well entrenched; low width/depth ratios; moderate gradient pool-riffle complex with gravel and cobble substrate.

SLOPE WATER MOVEMENT: Primarily subsurface on upper slopes, surface water increasing rapidly on breaks into larger streams. Water yield moderate and somewhat regulated.

OTHER IMPORTANT CHARACTERISTICS: Vegetative management can significantly effect water yields.

PARENT MATERIAL GROUP

This group includes moderately and well weathered schists and gneisses with interbedded pegmatites of the Belt Supergroup, commonly referred to as the high grade metamorphics of the Border Zone.



SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,800 feet on high energy slopes. Soil profiles are 60+ inches deep. Surface soil is volcanic ash 7 to 18 inches thick. Subsurface soil is coarse textured with 20 to 40% rock fragments and an estimated 10 to 20% mica content.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 12" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 7 to 18" thick).

Subsoil - 12 to 24" brown gravelly sandy loam to loam with weak subangular, blocky structure, slightly sticky, nonplastic, 20 to 40% rock fragments (range 10 to 22" thick).

Substratum - 25 to 48"+ pale brown gravelly sandy loam, structureless, nonsticky, nonplastic, 20 to 40% rock fragments.

SOIL CLASSIFICATION - Eutric Glossoboralfs, medial/loamy, mixed, frigid, and Andic Dystrochrepts, coarse-loamy, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Heavier textured subsoils with loam to silty clay loam textures occur in moist draws and depressions. Shallow (lithic - 20" deep) soils occur adjacent to bedrock outcrops. Ash caps are mixed and subsoils are both skeletal and nonskeletal on steep colluvial slopes.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is western red cedar/pachistima (THPL/PAMY).

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect high mass wasting potential, with high sediment delivery efficiency. Other ratings are low to moderate.

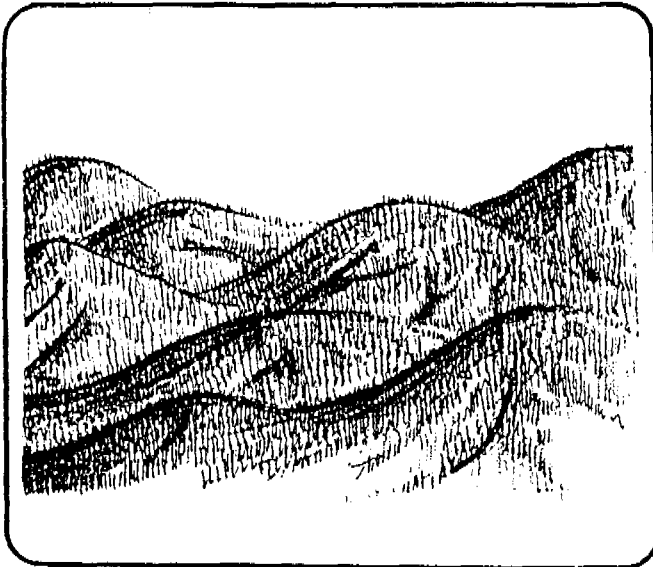
ENGINEERING - Potential road construction problems include a high risk of mass wasting and high sediment delivery efficiency due to high dissection density on steep slopes. Roads crossing slope breaks between ridgetops and sideslopes require careful location because of zones of mass instability. Cutbank sloughing and road surface rutting are common maintenance problems.

SILVICULTURE - This landtype has regeneration limitations because of high insolation rates.

POTENTIAL WILDLIFE HABITAT - This landtype is rated as having moderate potential for summer habitat. Where elevations are low enough to be accessible during periods of snow accumulation, winter habitat potential is rated moderate.



LANDTYPE 24-A01



SUMMARY

Number of map delineations - 19
Total acreage - 2,200
Average map unit acreage - 116

These units are located on low elevation, moderate relief rolling uplands. Soils are deep, well drained, and are developed in alluvial parent material. The habitat type is western red cedar/pachistima.

LANDFORM 24 MODERATE RELIEF ROLLING UPLANDS

Overall relief consists of rounded convex ridgetops and straight to concave sideslopes. Drainage patterns are dendritic and well developed.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 2,000 to 4,200 feet
- B. Slope Gradient - 20 to 40%
- C. Slope Shape - Compound with convex 30 to 90-foot wide ridgetops, slightly convex sideslopes and concave weakly V-shaped draws 20 to 60 feet wide.
- D. Overall Relief - 250 to 500 feet and occasionally up to 1,000 feet in large ridge system mapping units.
- E. Dissection Relief - 150 to 400 feet
- F. Dissection Density - 20 to 30 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Dendritic

STREAM DENSITY: 1-5 miles/mile²
MEAN: 3.25 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (85%)

CHANNEL TYPE: Fairly stable and moderately entrenched; low to moderate width/depth ratio; moderate energy; mostly graded.

SLOPE WATER MOVEMENT: Mostly subsurface with deep percolation and stream flow in established first-order stream channels. Water yield is well regulated.

SEDIMENT DELIVERY: Moderate with good storage capacity.

OTHER IMPORTANT CHARACTERISTICS: Streams are sensitive to increases in sediment and water yield, but such changes must usually be generated outside the unit. Water yield can be altered by vegetative management but it is regulated by the slopes.

PARENT MATERIAL GROUP

This group includes ancient alluvium deposits which are developed from Palouse loess, decomposed basalts and Border Zone rocks. The resulting deposition is fine textured with few rounded rock fragments.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 3,700 feet on all aspect slopes. The unit may range up to 4,200 feet elevation in the Beaver Block and on the Lolo Creek, Lochsa Divide. Soil profiles are 60+ inches deep and well drained. Surface soil is volcanic ash 6 to 23 inches thick. Subsurface soil is medium to fine textured with 10 to 20% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 15" dark brown silt loam with weak granular structure, nonsticky, nonplastic (range 6 to 23" thick).

Subsoil - 15 to 38" brown silty clay loam with strong subangular blocky structure, sticky, plastic, 10% to 20% rock fragments.

Substratum - 38 to 60"+ pale brown loam, structureless, slightly sticky, slightly plastic, 10 to 20% rounded coarse fragments.

SOIL CLASSIFICATION - Eutric GLOSSOBORALFs, medial/loamy, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Sandy subsoils occur as inclusions in the Musselshell area and skeletal phases of this unit have been observed in the Swede Creek area. Beaver Block soils of this unit are medium textured (silt loams) rather than typical clay loams and occur as mantles ranging from less than 3 feet deep on ridges to deep deposits in draws.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is western red cedar/pachistima (THPL/PAMY).

MANAGEMENT CONSIDERATIONS

WATERSHED - The watershed interpretations reflect high subsoil erosion and parent material erosion potentials. Other ratings are very low to moderate.

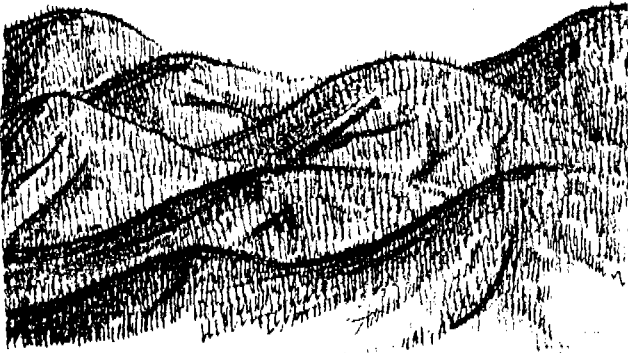
ENGINEERING - Potential road construction problems include high erosion rates in the excavated road prism. Materials have low bearing strengths and are subject to severe roadbed rutting if exposed to traffic when wet. Cutbank sloughing and ditch erosion are common maintenance problems.

SILVICULTURE - This landtype is one of the most productive on the Forest, with high moisture holding and high nutrient status capacities. There are no major regeneration limitations for this landtype, with all silvicultural systems applied successfully. Soil compaction potential is high in subsoil layers when the volcanic ash topsoil is removed.

POTENTIAL WILDLIFE HABITAT - This landtype is rated as having moderate potential for summer habitat. Where elevations are low enough to be accessible during periods of snow accumulation, winter habitat is rated moderate.



LANDTYPE 24-G10



SUMMARY

Number of map delineations - 167
Total acreage - 24,800
Average map unit acreage - 149

These units are located on low elevation, cool aspect, moderate relief rolling uplands. Soils are deep, well drained and are developed in granitic parent material. The habitat type is western red cedar/pachistima.

LANDFORM 24 MODERATE RELIEF ROLLING UPLANDS

Overall relief consists of rounded convex ridgetops and straight to concave sideslopes. Drainage patterns are dendritic and well developed.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 2,000 to 4,800 feet
- B. Slope Gradient - 20 to 40%, including small areas with slopes up to 50% or greater.
- C. Slope Shape - Compound with convex 30 to 90-foot wide ridgetops, slightly convex sideslopes and concave weakly V-shaped draws 20 to 60 feet wide.
- D. Overall Relief - 250 to 500 feet and occasionally up to 1,000 feet in large ridge system mapping units.
- E. Dissection Relief - 150 to 400 feet
- F. Dissection Density - 20 to 30 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Dendritic

STREAM DENSITY: 1-5 miles/mile²
MEAN: 3.25 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (85%)

CHANNEL TYPE: Fairly stable and moderately entrenched; low to moderate width/depth ratio; moderate energy; mostly graded.

SLOPE WATER MOVEMENT: Mostly subsurface with deep percolation and stream flow in established first-order stream channels. Water yield is well regulated.

SEDIMENT DELIVERY: Moderate with good storage capacity.

OTHER IMPORTANT CHARACTERISTICS: Streams are sensitive to increases in sediment and water yield, but such changes must usually be generated outside the unit. Water yield can be altered by vegetative management but it is regulated by the slopes.

PARENT MATERIAL GROUP

This group includes well weathered granites and associated gneisses from the Idaho Batholith. The Palouse District has units which have migmatite derived soils.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,800 feet on low energy slopes. Soil profiles are 60+ inches deep. Surface soil is volcanic ash 10 to 24 inches thick. Subsurface soil is coarse textured with 10 to 40% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 16" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 10 to 24" thick).

Subsoil - 16 to 36" brown gravelly sandy loam with weak subangular blocky structure, non sticky, nonplastic, 10 to 40% rock fragments (range 10 to 40" thick).

Substratum - 36 to 60"+ pale brown gravelly sandy loam, structureless, nonsticky, nonplastic, 10 to 40% rock fragments.

SOIL CLASSIFICATION - Typic Vitrandepts, medial/loamy, mixed, frigid, and Andic Dystrochrepts, coarse-loamy, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Soil variations are limited to ash cap mixing in areas of colluvial movement or the presence of clay accumulation horizons (argillic - weak alfisols) in moist draws. Shallow (lithic) soils may occur in association with rock outcrops. Areas on the Palouse may have Cryic soil temperatures. Eighty percent of these units are nonskeletal, 20% are skeletal. Most coarse fragments are pea sized gravel.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is western red cedar/pachistima (THPL/PAMY), primarily on the moist end of the range. Western hemlock/pachistima (TSHE/PAMY) occurs on the west end of the Palouse District.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a high parent material erosion potential. Exposed cuts and fills on roads and skid trails are subject to severe erosion hazards. Other watershed ratings are very low to moderate.

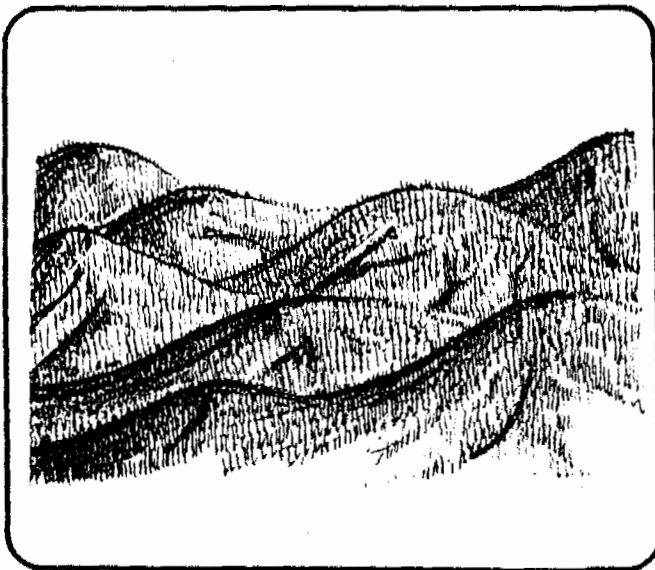
ENGINEERING - Potential road construction problems include high erosion rates in the excavated road prism with a moderate risk of sediment being delivered to streams. Dry cutbank raveling is a common maintenance problem.

SILVICULTURE - This landtype has no major silvicultural regeneration limitations. The high productivity of this landtype can be maintained by insuring that the ash topsoil is not removed or displaced. Major soil fertility differences occur between surface soils and subsoils.

POTENTIAL WILDLIFE HABITAT - This landtype is rated as having moderate potential for summer habitat. Where elevations are low enough to be accessible during periods of snow accumulations, winter habitat is rated moderate.



LANDTYPE 24-G20



SUMMARY

Number of map delineations - 199
Total acreage - 22,500
Average map unit acreage - 113

These units are located on low elevation, warm aspect moderate relief rolling uplands. Soils are deep, well drained and are developed in granitic parent material. The habitat type is western red cedar/pachistima.

LANDFORM

Overall relief consists of rounded convex ridgetops and straight to concave sideslopes. Drainage patterns are dendritic and well developed.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 2,000 to 4,800 feet
- B. Slope Gradient - 20 to 40%
- C. Slope Shape - Compound with convex 30 to 90-foot wide ridgetops, slightly convex sideslopes and concave weakly V-shaped draws 20 to 60 feet wide.
- D. Overall Relief - 250 to 500 feet and occasionally up to 1,000 feet in large ridge system mapping units.
- E. Dissection Relief - 150 to 400 feet
- F. Dissection Density - 20 to 30 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Dendritic

STREAM DENSITY: 1-5 miles/mil.²
MEAN: 3.25 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (85%)

CHANNEL TYPE: Fairly stable and moderately entrenched; low to moderate width/depth ratio; moderate energy; mostly graded.

SLOPE WATER MOVEMENT: Mostly subsurface with deep percolation and stream flow in established first-order stream channels. Water yield is well regulated.

SEDIMENT DELIVERY: Moderate with good storage capacity.

OTHER IMPORTANT CHARACTERISTICS: Streams are sensitive to increases in sediment and water yield, but such changes must usually be generated outside the unit. Water yield can be altered by vegetative management but it is regulated by the slopes.

PARENT MATERIAL GROUP

This group includes well weathered granites and associated gneisses from the Idaho Batholith.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,800 feet on high energy slopes. Soil profiles are 60+ inches deep. Surface soil is volcanic ash 7 to 24 inches thick. Subsurface soil is coarse textured with 10 to 40% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 14" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 7 to 24" thick).

Subsoil - 14 to 36" brown gravelly sandy loam with granular structure, nonsticky, nonplastic, 10 to 35% rock fragments (range 8 to 40" thick).

Substratum - 36 to 60"+ pale brown gravelly sandy loam, structureless, nonsticky, nonplastic, 10 to 40% rock fragments.

SOIL CLASSIFICATION - Typic Vitrandepts, medial/loamy, mixed, frigid, and Andic Dystrochrepts, coarse-loamy, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Soil variations are limited to ash surface mixing in areas of active colluvial movement or the presence of clay accumulation horizons (argillics-weak Alfisols) in moist draw soils. Ash caps will be mixed and thinner on steeper southerly slopes.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is western red cedar/pachistima (THPL/PAMY) with grand fir/pachistima (GF/PAMY) occurring on upper ridges and steeper southerly slopes.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a high parent material erosion potential. Exposed cuts and fills on roads and skid trails are subject to severe erosion hazards. Other watershed ratings are very low to moderate. Sediment delivery efficiency is moderate.

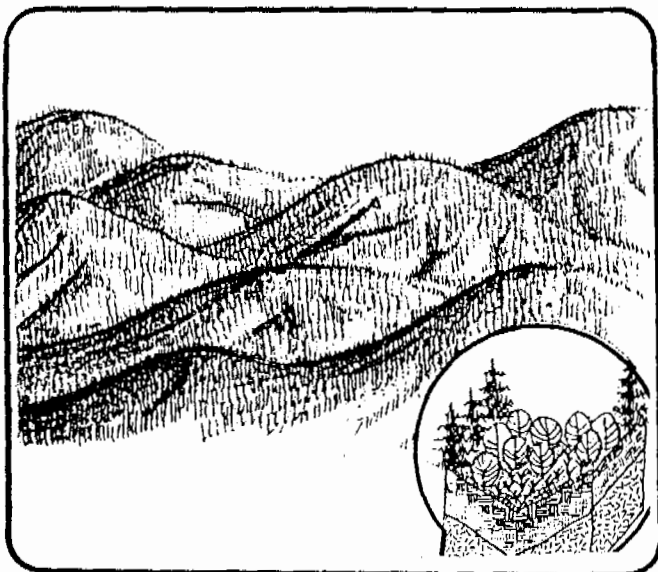
ENGINEERING - Potential road construction problems include high erosion rates in the excavated road prism with a moderate risk of sediment being delivered to streams. Dry cutbank raveling is a common maintenance problem.

SILVICULTURE - This landtype has no major silvicultural regeneration limitations. Major soil fertility differences occur between surface soils and subsoils. The high productivity of this landtype can be maintained by minimizing ash cap disturbance.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate as potential summer habitat. Because this unit does not generally occur at very low elevations, it is inaccessible during periods of snow accumulation, and rated low for potential winter habitat.



LANDTYPE 24-G45



SUMMARY

Number of map delineations - 125
Total acreage - 18,000
Average map unit acreage - 144

These units are located on low elevation, moderate relief, rolling uplands. Soils are well drained on ridges, poorly drained in draws, and have deep profiles developed in granite parent material. The habitat type is western red cedar/pachistima with riparian vegetation in the wet draws.

LANDFORM 24 MODERATE RELIEF ROLLING UPLANDS

Overall relief consists of rounded convex ridgetops and straight to concave sideslopes. Drainage patterns are dendritic and well developed.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 3,200 to 4,800 feet
- B. Slope Gradient - 20 to 40%, including small areas with slopes up to 50% or greater.
- C. Slope Shape - Compound with convex 30 to 90-foot wide ridgetops, slightly convex sideslopes and concave weakly V-shaped draws 20 to 60 feet wide.
- D. Overall Relief - 250 to 500 feet and occasionally up to 1,000 feet in large ridge system mapping units.
- E. Dissection Relief - 150 to 400 feet
- F. Dissection Density - 20 to 30 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Dendritic

STREAM DENSITY: 1-5 miles/mile²
MEAN: 3.25 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (85%)

CHANNEL TYPE: Channel banks and beds are poorly defined and contain higher proportions of fine.

SLOPE WATER MOVEMENT: Water movement in draws and swales is subsurface with frequent springs, seeps, and bogs. Interflaves are well drained with significant subsurface flows.

SEDIMENT DELIVERY: Moderate with good storage capacity.

OTHER IMPORTANT CHARACTERISTICS: Streams are sensitive to increases in sediment and water yield, but such changes must usually be generated outside the unit. Water yield can be altered by vegetative management but it is regulated by the slopes.

PARENT MATERIAL GROUP

This group contains weathered granitics and associated gneisses of the Idaho Batholith.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,800 feet on all aspect slopes. Soil profiles are 60+ inches deep. Well drained ridge soils have a volcanic ash surface 9 to 27 inches thick. Poorly drained soils have a darkened, modified volcanic ash surface 9 to 24 inches thick. Subsurface soil is coarse textured with 10 to 40% rock fragments. Naturally dense fragipan layers may occur in wet draws.

TYPICAL SOIL PROFILES

(Well drained)

Surface Soil - 0 to 18" dark brown silt loam with weak granular structure, nonsticky, nonplastic, less than 10% rock fragments, (range 9 to 27" thick).

Subsoil - 18 to 38" brown sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 10 to 40% rock fragments, (range 12 to 30" thick).

Substratum - 38 to 60"+ pale brown sandy loam - loamy sand, structureless, nonsticky, nonplastic, 10 to 40% rock fragments.

(Poorly drained soil - draws)

Surface Soil - (modified ash) 0 to 15" very dark brown to black silt loam, weak granular structure, slightly sticky, nonplastic, less than 10% rock fragments, (range 9 to 24" thick).

Subsoil/Substratum - 15"+ usually poorly drained, range from gleyed sandy material to gravelly loamy fragipans.

SOIL CLASSIFICATION - Typic Vitrandepts, medial/loamy, mixed frigid; Andic Dystrachrepts, coarse-loamy, mixed, frigid; and Typic Haplumbrepts, coarse-loamy, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Soils with grussic (sandy) parent material can occur in this unit. Rock content in these profiles is generally less than 35% (nonskeletal).

VEGETATIVE CHARACTERISTICS - The dominant habitat types on well drained ridges are western red cedar/pachistima (YHPL/PAMY) and grand fir/pachistima (ABGR/PAMY). Poorly drained areas have alder, fern, and sedge vegetation. Dense areas of fern growth may be present.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a high parent material erosion potential. Other ratings are very low to moderate.

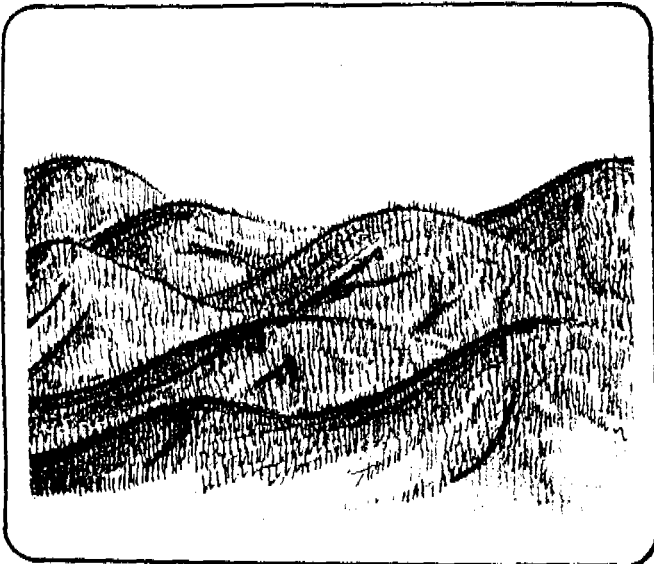
ENGINEERING - Potential road construction problems are wet draws and erosion rates in the excavated road prism with a moderate risk of sediment being delivered to streams. Dry cutbank raveling, cutbank sloughing, and rapid brush encroachment are common maintenance problems.

SILVICULTURE - Regeneration limitations for this landtype are related to severe brush competition, high water tables, and dark colored umbric soils, all of which are dominant in wet draw areas. Soil compaction potential is also rated high in wet parts of this unit. Ridges and other well drained portions of this landtype have few silvicultural limitations.

POTENTIAL WILDLIFE HABITAT - This landtype is rated high for potential wildlife summer range because of high diversity, and high for winter range in areas not limited by excessive snow depths.



LANDTYPE 24-K10



SUMMARY

Number of map delineations - 49
Total acreage - 12,600
Average map unit acreage - 257

These units are located on low elevation, cool aspect, moderate relief, rolling uplands. Soils are deep, well drained, and are developed in grussic granitic parent material. The habitat type is western red cedar/pachistima.

LANDFORM 24 MODERATE RELIEF ROLLING UPLANDS

Overall relief consists of rounded convex ridgetops and straight to concave sideslopes. Drainage patterns are dendritic and well developed.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 2,000 to 4,800 feet
- B. Slope Gradient - 20 to 40%, including small areas with slopes up to 50% or greater
- C. Slope Shape - Compound with convex 30 to 90-foot wide ridgetops, slightly convex sideslopes and concave weakly V-shaped draws 20 to 60 feet wide.
- D. Overall Relief - 250 to 500 feet and occasionally up to 1,000 feet in large ridge system mapping units.
- E. Dissection Relief - 150 to 400 feet
- F. Dissection Density - 20 to 30 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Dendritic

STREAM DENSITY: 1-5 miles/mile²
MEAN: 3.25 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (85%)

CHANNEL TYPE: Fairly stable and moderately entrenched; low to moderate width/depth ratio; moderate energy; mostly graded.

SLOPE WATER MOVEMENT: Mostly subsurface with deep percolation and stream flow in established first-order stream channels. Water yield is well regulated.

SEDIMENT DELIVERY: Moderate with good storage capacity.

OTHER IMPORTANT CHARACTERISTICS: Streams are sensitive to increases in sediment and water yield, but such changes must usually be generated outside the unit. Water yield can be altered by vegetative management but it is regulated by the slopes.

PARENT MATERIAL GROUP

This group includes deeply weathered grussic granitics of the Idaho Batholith. Volcanic ash material lies directly over decomposed granitic material which has very little soil development and is relatively impermeable.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,800 feet on low energy slopes. Soil profiles are 60+ inches deep. Surface soil is volcanic ash 8 to 22 inches thick. Subsurface soil is coarse textured with 10 to 40% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 14" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 8 to 22" thick).

Subsoil - 14 to 25" brown gravelly sandy loam or loamy sand with weak subangular blocky structure, nonsticky, nonplastic, 10 to 40% pea sized gravels (5 to 15" thick).

Substratum - 25 to 60"+ pale brown gravelly loamy sand, structureless, nonsticky, nonplastic, 10 to 40% pea sized gravels.

SOIL CLASSIFICATION - Typic Vitrandepts, medial/sandy, mixed, frigid; and Andic Dystrochrepts, sandy, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Major soil variations are depth and amount of mixing of the ash cap. Soils with thick loamy IIB2 horizons may occur in moist draws and on gentle slopes. Grain size of the weathered granitics influence whether or not the soil is classified as skeletal. Soils with agrillic horizons occur as inclusions on ridges. Soils which support hemlock vegetation may have cryic temperature regimes.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is western red cedar/pachistima (THPL/PAMY) at the moist end of the range. Some units in the west end of the Palouse District support western hemlock/pachistima (TSHE/PAMY).

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a very high parent material erosion and a high subsoil erosion potential. Exposed subsurface soils on roads and skid trails are subject to severe erosion. A major watershed objective should be to prevent eroded material from reaching stream courses.

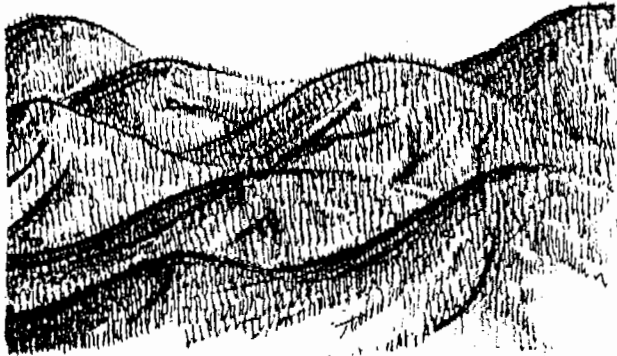
ENGINEERING - Potential road construction problems include a very high erosion rate in the excavated road prism with a moderate risk of sediment being delivered to streams. Dry cutbank raveling is a common maintenance problem. Cut and fill slopes are especially difficult to revegetate. Seeding, fertilizing, and mulching operations on cut and fill slopes are often unsuccessful.

SILVICULTURE - The volcanic ash topsoil is critical to the productivity of this landtype, and mechanical operations should avoid removal or displacement of this layer. Much of the nutrient status and moisture holding capacity of this soil is within the ash.

POTENTIAL WILDLIFE HABITAT - This landtype is rated as having moderate potential for summer habitat. Winter habitat potential is rated low because this unit occurs above those elevations which are accessible during periods of snow accumulation.



LANDTYPE 24-K20



SUMMARY

Number of delineations - 77
Total acreage - 5,200
Average map unit acreage - 68

These units are located on low elevation, warm aspect, moderate relief rolling uplands. Soils are deep, well drained, and are developed in grussic granitic parent material. The habitat types are western red cedar/pachistima and grand fir/pachistima.

LANDFORM 24 MODERATE RELIEF ROLLING UPLANDS

Overall relief consists of rounded convex ridgetops and straight to concave sideslopes. Drainage patterns are dendritic and well developed.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 2,000 to 4,800 feet
- B. Slope Gradient - 20 to 40%, including small areas with slopes up to 50% or greater.
- C. Slope Shape - Compound with convex 30 to 90-foot wide ridgetops, slightly convex sideslopes and concave weakly V-shaped draws 20 to 60 feet wide.
- D. Overall Relief - 250 to 500 feet and occasionally up to 1,000 feet in large ridge system mapping units.
- E. Dissection Relief - 150 to 400 feet
- F. Dissection Density - 20 to 30 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Dendritic

STREAM DENSITY: 1-5 miles/mile²
MEAN: 3.25 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (85%)

CHANNEL TYPE: Fairly stable and moderately entrenched; low to moderate width/depth ratio; moderate energy; mostly graded.

SLOPE WATER MOVEMENT: Mostly subsurface with deep percolation and stream flow in established first-order stream channels. Water yield is well regulated.

SEDIMENT DELIVERY: Moderate with good storage capacity.

OTHER IMPORTANT CHARACTERISTICS: Streams are sensitive to increases in sediment and water yield, but such changes must usually be generated outside the unit. Water yield can be altered by vegetative management but it is regulated by the slopes.

PARENT MATERIAL GROUP

This group consists of deeply weathered grussic granitics of the Idaho Batholith. Ash material lies directly over decomposed granitic material with very little soil development and is relatively impermeable.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,800 feet on high energy slopes. Soil profiles are generally more than 48 inches deep. Surface soil is volcanic ash 8 to 16 inches thick. Subsurface soil is coarse textured with 10 to 40% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 10" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 7 to 16" thick).

Subsoil - 10 to 30" brown gravelly loamy sand with weak subangular blocky structure, nonsticky nonplastic, 10 to 40% pea sized gravels (range 10 to 22" thick).

Substratum - 30 to 50"+ light brown gravelly loamy sand, structureless, nonsticky, nonplastic, 10 to 40% pea sized gravels (range 10 to 22" thick).

SOIL CLASSIFICATION - Andic Dystrachrepts, sandy, mixed, frigid, and Typic Vitrandepts, medial/sandy, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Shallow, lithic soils (< 20" deep) occur on ridgetops. Shallow soils tend to occur on southerly slopes on ridgetops. Ash caps are strongly mixed on steeper southerly slopes. Deeper, loamy soils occur in draws.

VEGETATIVE CHARACTERISTICS - The dominant habitat types are western red cedar/pachistima (THPL/PAMY) on deeper soils and grand fir/pachistima (ABGR/PAMY) on drier, shallow sites.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect very high parent material and high subsoil erosion potentials. Exposed subsurface soils on roads and skid trails are subject to severe erosion. A major watershed objective should be to prevent eroded material from reaching stream courses.

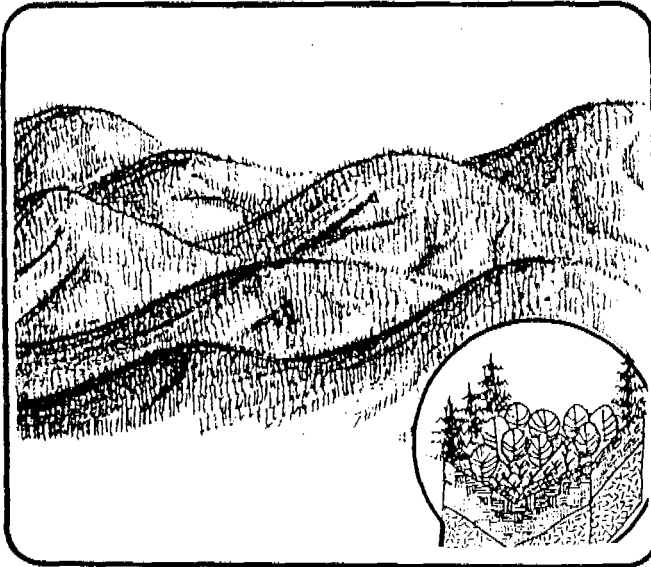
ENGINEERING - Potential road construction problems include a very high erosion rate in the excavated road prism, with a moderate risk of sediment being delivered to streams. Dry cutbank raveling is a common maintenance problem. Cut and fill slopes are especially difficult to revegetate. Seeding, fertilizing, and mulching operations on cut and fill slopes are often unsuccessful.

SILVICULTURE - The volcanic ash topsoil is critical to the productivity of this landtype, and logging or slash disposal operations should avoid removal or displacement of this surface layer. Ash removal in such landtypes greatly reduces the moisture holding and nutrient supplying capacity of these soils. With the ash topsoil intact, this landtype has few silvicultural limitations.

POTENTIAL WILDLIFE HABITAT - This landtype is rated as having moderate potential for summer-range. Where elevations are low enough to be accessible during periods of snow accumulation, winter habitat potential is rated moderate.



LANDTYPE 24-K45



SUMMARY

Number of map delineations - 44
Total acreage - 6,700
Average map unit acreage - 152

These units are located on low elevation, moderate relief rolling uplands. Soils are well drained on ridges, poorly drained in draws, and have deep profiles developed in gussic granitic parent material. The habitat type is grand fir/pachistima with riparian vegetation in wet draws.

LANDFORM 24 MODERATE RELIEF ROLLING UPLANDS

Overall relief consists of rounded convex ridgetops and straight to concave sideslopes. Drainage patterns are dendritic and well developed.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - below 4,800 feet et
- B. Slope Gradient - 20 to 40%, including small areas with slopes up to 50% or greater.
- C. Slope Shape - Compound with convex 30 to 90-foot wide ridgetops, slightly convex sideslopes and concave weakly V-shaped draws 20 to 60 feet wide.
- D. Overall Relief - 250 to 500 feet and occasionally up to 1,000 feet in large ridge system mapping units.
- E. Dissection Relief - 150 to 400 feet
- F. Dissection Density - 20 to 30 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Dendritic

STREAM DENSITY: 1-5 miles/mile²
MEAN: 3.25 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (85%)

CHANNEL TYPE: Channel banks and beds are poorly defined and contain higher proportions of fine.

SLOPE WATER MOVEMENT: Water movement in draws and swales is subsurface with frequent springs, seeps, and bogs. Interfluves are well drained with significant subsurface flows.

SEDIMENT DELIVERY: Moderate with good storage capacity.

OTHER IMPORTANT CHARACTERISTICS: Streams are sensitive to increases in sediment and water yield, but such changes must usually be generated outside the unit. Water yield can be altered by vegetative management but it is regulated by the slopes.

PARENT MATERIAL GROUP

Deeply weathered gussic granitics of the Idaho Batholith. Ash material lies directly over the decomposed granitic material. Subsurface soils have little soil development and are relatively impermeable.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,800 feet on all aspect slopes. Soil profiles are 60+ inches deep. Well drained ridge soils have a volcanic ash surface 8 to 24 inches thick. Poorly drained draw soils have a darkened, modified volcanic ash surface 6 to 15 inches thick. Subsurface soil is coarse textured with 10 to 40% rock fragments. Naturally dense fragipan layers may occur in draws resulting in perched water.

TYPICAL SOIL PROFILES

(Well drained soil)

Surface Soil - 0 to 14" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 8 to 24" thick).

Subsoil - 14 to 30" brown gravelly loamy sand with weak subangular blocky structure, nonsticky, nonplastic, 10 to 40% pea sized gravels.

((Substratum)) - 30 to 60" pale brown gravelly loamy sand, structureless, nonsticky, nonplastic, 20 to 40% rock fragments.

(Poorly drained soil)

Surface Soil - 0 to 8" very dark brown silt loam with weak subangular blocky structure, nonsticky, nonplastic (range 6 to 15" thick).

Subsoil - 8 to 25" dark greyish brown gravelly sandy loam, weak subangular blocky structure, nonsticky, nonplastic, 10 to 40% rock fragments (range 15 to 30" thick).*

Substratum - 25 to 60" pale brown gravelly loamy sand, structureless, nonsticky, nonplastic, 20 to 40% pea sized gravels.*

*NOTE: These horizons may have a naturally dense (fragipan) layer which may cause perching of water and poor drainage.

SOIL CLASSIFICATION - Typic Vitrandepts, medial/sandy, mixed, frigid; Andic Dystrochrepts, sandy, mixed, frigid; and Typic Haplumbrepts, coarse-loamy, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Approximately 40% of this unit has skeletal soils.

VEGETATIVE CHARACTERISTICS - The dominant habitat types on well drained ridges are grand fir/pachistima (ABGR/PAMY) and western red cedar/pachistima (THPL/PAMY). Poorly drained draws support alder, fern, and sedge vegetation.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a high subsoil and a very high parent material erosion potential. Because of this highly erosive characteristic, skidding, site preparation, and soil disposal operations should avoid removal or displacement of the volcanic ash topsoil. A major watershed objective should be to minimize the movement of eroded material into drainages.

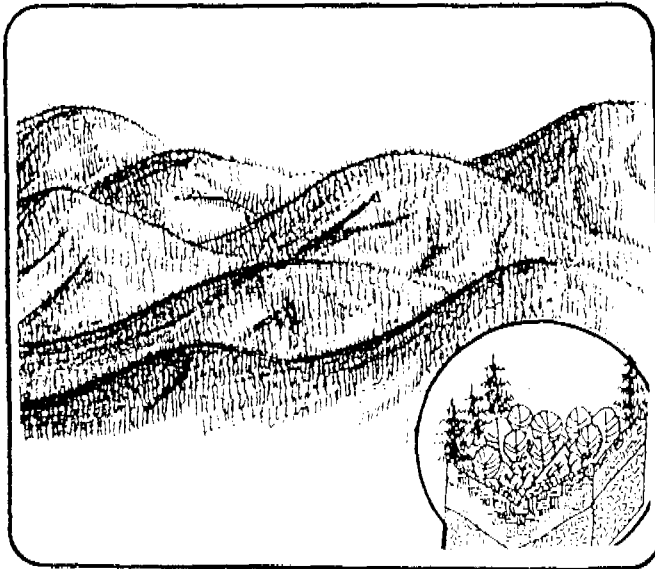
ENGINEERING - Potential road construction problems are those associated with wet draws and very high erosion rates in the excavated road prism with a moderate risk of sediment being delivered to streams. Dry cutbank raveling and rapid brush encroachment are common maintenance problems. Cut and fill slopes are especially difficult to revegetate. Seeding, fertilizing, and mulching operations on cut and fill slopes are often unsuccessful.

SILVICULTURE - The volcanic ash topsoil is critical to the productivity of this landtype, and mechanical operations should avoid removal or displacement of this layer. Much of the nutrient status and moisture holding capacity of this soil is within the ash. Historically, dark colored (umbric) soils of this landtype have supported clumpy timber and are difficult to regenerate because of high water tables and severe fern or brush competition.

POTENTIAL WILDLIFE HABITAT - This landtype has important properties associated with potential habitat including food, water, cover, and vegetative diversity. Alder draws and wet brushy areas provide potential summer habitat for elk, deer, and small fur bearers. At lower elevations, such areas can be important for elk and deer winter range.



LANDTYPE 24-Q45



SUMMARY

Number of map delineations - 21
Total acreage - 8,700
Average map unit acreage - 411

These units are located on low elevation, moderate relief uplands. Soils are well drained on ridges, poorly drained in draws, and have deep profiles developed in quartzite parent material. The habitat is western red cedar/pachistima with riparian vegetation in wet draws.

LANDFORM 24 MODERATE RELIEF ROLLING UPLANDS

Overall relief consists of rounded convex ridgetops and straight to concave sideslopes. Drainage patterns are dendritic and well developed.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - below 4,800'
- B. Slope Gradient - 20 to 40%, including small areas with slopes up to 50% or greater.
- C. Slope Shape - Compound with convex 30 to 90-foot wide ridgetops, slightly convex sideslopes and concave weakly V-shaped draws 20 to 60 feet wide.
- D. Overall Relief - 250 to 500 feet and occasionally up to 1,000 feet in large ridge system mapping units.
- E. Dissection Relief - 150 to 400 feet
- F. Dissection Density - 20 to 30 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Dendritic

STREAM DENSITY: 1-5 miles/mile²
MEAN: 3.25 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (85%)

CHANNEL TYPE: Channel banks and beds are poorly defined and contain higher proportions of fine.

SLOPE WATER MOVEMENT: Water movement in draws and swales is subsurface with frequent springs, seeps, and bogs. Interfluvies are well drained with significant subsurface flows.

SEDIMENT DELIVERY: Moderate with good storage capacity.

OTHER IMPORTANT CHARACTERISTICS: Streams are sensitive to increases in sediment and water yield, but such changes must usually be generated outside the unit. Water yield can be altered by vegetative management but it is regulated by the slopes.

PARENT MATERIAL GROUP

This group includes quartzites, argillites, and siltites developed in the Belt formation of sedimentary rocks, exclusive of the Revett formation.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,800' on all aspect slopes. Soil profiles are 60"+ deep, well drained ridge soils have a volcanic ash surface 8 to 21 inches thick. Poorly drained soils have a darkened modified volcanic ash surface 7 to 20 inches thick. Subsurface soil is coarse textured with 20 to 50% rock fragments. Naturally dense fragipan layers may occur in wet draws.

TYPICAL SOIL PROFILES

(Well drained soil)

Surface soil - 0 to 16" dark brown silt loam with weak granular structure, nonsticky, nonplastic, less than 10% rock fragment, (range 8 to 21 " thick).

Subsoil - 16 to 37" brown sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 10 to 50% rock fragments, (range 15 to 30" thick).

Substratum - 37 to 60"+ pale brown sandy loam, structureless, nonsticky, nonplastic, 20 to 50% rock fragments.

(Poorly drained soil)

Surface soil - (Modified ash) - 0 to 13" very dark brown to black silt loam, weak granular structure, slightly sticky, nonplastic, less than 10% rock fragments, (range 7 to 20" thick).

Subsoil/Substratum - 13"+ usually poorly drained, ranging from gleyed sandy loam material to gravelly loamy fragipans.

SOIL CLASSIFICATION - Typic Vitrandepts, medial/loamy, mixed frigid; Andic Dystrachrepts, coarse-loamy, mixed, frigid; and Typic Haplumbrepts, coarse-loamy, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Rock content in these profiles is variable, but is normally less than 35% (nonskeletal).

VEGETATIVE CHARACTERISTICS - The dominant habitat type on well drained ridges is western red cedar/pachistima (THPL/PAMY). Poorly drained draws have alder, fern, and sedge vegetation.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect low to moderate potential hazard ratings.

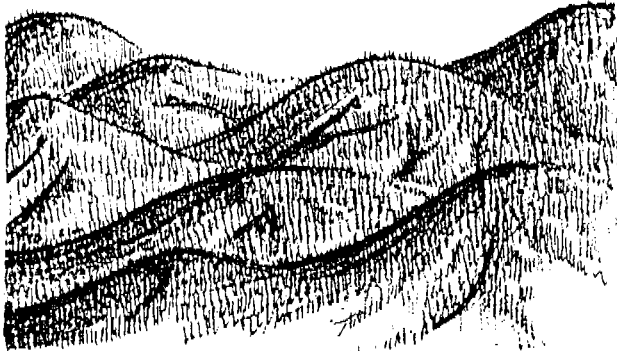
ENGINEERING - The only significant road construction problems in this landtype are those associated with wet draws. Cutbank sloughing and rapid brush encroachment are common maintenance problems.

SILVICULTURE - Regeneration limitations include seasonal high water tables, umbric soils and severe brush competition, all of which dominate wet draw areas. Ridges and other well drained portions of this landtype have few silvicultural limitations.

POTENTIAL WILDLIFE HABITAT - This landtype is rated high for potential wildlife summer range because of high diversity. Where elevations are low enough to be accessible during periods of snow accumulation, winter habitat potential is also rated high.



LANDTYPE 24-ROO



SUMMARY

Number of map delineations - 11
Total acreage - 1,700
Average map unit acreage - 155

These units are located on low elevation, moderate relief rolling uplands. Soils are deep, well drained, and are developed in Revett quartzite parent material. The habitat type is western red cedar/pachistima. This unit is restricted to the Osier Basin of Kelly Creek District.

LANDFORM 24 MODERATE RELIEF ROLLING UPLANDS

Overall relief consists of rounded convex ridgetops and straight to concave sideslopes. Drainage patterns are dendritic and well developed.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 3,600 to 4,800 feet
- B. Slope Gradient - 20 to 40% including small areas up to 50% or greater
- C. Slope Shape - Compound with convex 30 to 90-foot wide ridgetops, slightly convex sideslopes and concave weakly V-shaped draws 20 to 60 feet wide.
- D. Overall Relief - 250 to 500 feet and occasionally up to 1,000 feet in large ridge system mapping units.
- E. Dissection Relief - 150 to 400 feet
- F. Dissection Density - 20 to 30 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Dendritic

STREAM DENSITY: 1-5 miles/mile²
MEAN: 3.25 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (85%)

CHANNEL TYPE: Fairly stable and moderately entrenched; low to moderate width/depth ratio; moderate energy; mostly graded.

SLOPE WATER MOVEMENT: Mostly subsurface with deep percolation and stream flow in established first-order stream channels. Water yield is well regulated.

SEDIMENT DELIVERY: Moderate with good storage capacity.

OTHER IMPORTANT CHARACTERISTICS: Streams are sensitive to increases in sediment and water yield, but such changes must usually be generated outside the unit. Water yield can be altered by vegetative management but it is regulated by the slopes.

PARENT MATERIAL GROUP

This group includes Revett quartzite. This bedrock is located in the Osier Basin on the Kelly Creek District. This is well weathered quartzite which decomposes rapidly to sand when the rock is exposed to the elements.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,800 feet and includes all aspects. Soil profiles are 60+ inches deep. Surface soil is volcanic ash 7 to 20 inches thick. Subsurface soil is medium textured with 5 to 30% well weathered rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 14" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 7 to 20" thick).

Subsoil - 14 to 32" brown very fine sandy loam to loamy sand with weak subangular blocky structure, nonsticky, nonplastic, 5 to 20% well weathered rock fragments (range 6 to 35" thick).

Substratum - 32 to 60"+ pale brown gravelly very fine loamy sand, structureless, nonsticky, nonplastic, 10 to 30% well weathered rock fragments.

SOIL CLASSIFICATION - Typic Vitrandepts, medial/loamy, mixed, frigid, and Andic Dystrochrepts, coarse-loamy, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Variations are ash cap depth and percentage of coarse fragments in subsoils and parent material.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is western red cedar/pachistima (THPL/PAMY).

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a high parent material erosion potential, and a high subsoil erosion potential. A major watershed objective should be to minimize the movement of eroded material into drainages.

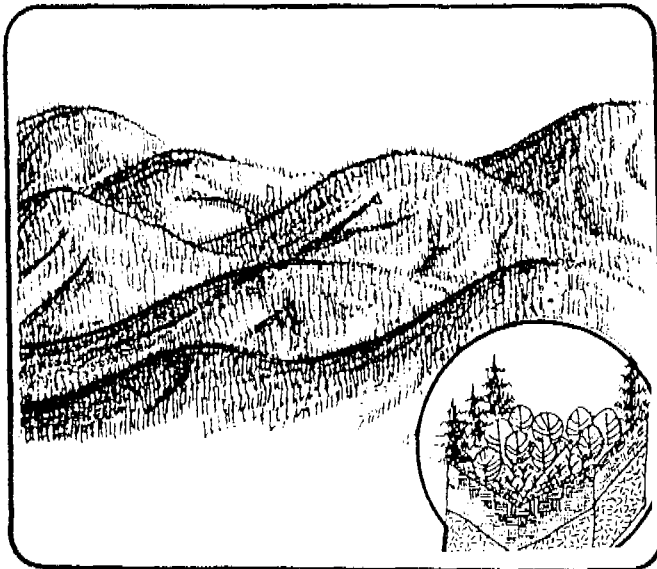
ENGINEERING - Potential road construction problems include high erosion rates in the excavated road prism with a moderate risk of sediment being delivered to streams. Cutbank and fill sloughing are common maintenance problems. The trafficability rating for road surfaces is poor. Cut and fill slopes are susceptible to the piping of water.

SILVICULTURE - The volcanic ash topsoil is important to the productivity of this landtype and heavy equipment operations should avoid removal or displacement of this surface layer. Ash removal results in a loss of moisture holding and nutrient supplying capacity. With the ash topsoil intact, there are few regeneration limitations for this landtype.

POTENTIAL WILDLIFE HABITAT - This landtype is rated as having moderate potential for summer habitat and moderate potential for winter habitat at low elevations where snow depths do not limit access.



LANDTYPE 24-R45



SUMMARY

Number of map delineations - 14
Total acreage - 2,200
Average map unit acreage - 157

These units are located on low elevation, moderate relief rolling uplands. Soils are well drained on ridges, poorly drained in draws and have deep profiles developed in Revett quartzite parent material. The habitat type includes both western red cedar and subalpine fir/pachistima with riparian vegetation in wet draws.

LANDFORM 24 MODERATE RELIEF ROLLING UPLANDS

Overall relief consists of rounded convex ridgetops and straight to concave sideslopes. Drainage patterns are dendritic and well developed.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - below 5,500 feet
- B. Slope Gradient - 20 to 40%, including small areas with slopes up to 50% or greater.
- C. Slope Shape - Compound with convex 30 to 90-foot wide ridgetops, slightly convex sideslopes and concave weakly V-shaped draws 20 to 60 feet wide.
- D. Overall Relief - 250 to 500 feet and occasionally up to 1,000 feet in large ridge system mapping units.
- E. Dissection Relief - 150 to 400 feet
- F. Dissection Density - 20 to 30 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Dendritic

STREAM DENSITY: 1-5 miles/mile²
MEAN: 3.25 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (85%)

CHANNEL TYPE: Channel banks and beds are poorly defined and contain higher proportions of fine.

SLOPE WATER MOVEMENT: Water movement in draws and swales is subsurface with frequent springs, seeps, and bogs. Interfluves are well drained with significant subsurface flows.

SEDIMENT DELIVERY: Moderate with good storage capacity.

OTHER IMPORTANT CHARACTERISTICS: Streams are sensitive to increases in sediment and water yield, but such changes must usually be generated outside the unit. Water yield can be altered by vegetative management but it is regulated by the slopes.

PARENT MATERIAL GROUP

This group includes Revett quartzite which is located in the Osier Basin on the Kelly Creek District. This is well weathered quartzite which decomposes rapidly to sand when the rock is exposed to the elements.

SOIL-VEGETATION UNIT-

This unit occurs at elevations below 5,500 feet on all aspect slopes. Soil profiles are 60+ inches deep. Well drained ridge soils have a volcanic ash surface 10 to 20 inches thick. Poorly drained draw soils have a darkened, modified volcanic ash surface 5 to 20 inches thick. Subsurface soil is medium to coarse textured with 10 to 30% rock fragments. Naturally dense fragipan layers may occur in wet draws.

TYPICAL SOIL PROFILES

(Well drained soil)

Surface Soil - 0 to 12" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 10 to 20" thick).

Subsoil - 12 to 30" brown gravelly fine sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 10 to 30% rock fragments.

Substratum - 30 to 60"+ light brown gravelly fine sandy loam, structureless, nonsticky, nonplastic, 10 to 30% rock fragments.

(Poorly drained soil)

Surface Soil - very dark brown silt loam with weak subangular blocky structure, nonsticky, nonplastic, (range 5 to 20" thick).

Subsoil - 14 to 30" dark greyish brown silt loam with weak subangular blocky structure, nonsticky, nonplastic (range 5 to 20" thick).*

Substratum - 30 to 60"+ pale brown gravelly fine sandy loam, structureless, nonsticky, nonplastic, 20 to 30% rock fragments.*

*NOTE: These horizons may have a naturally dense (fragipan) layer which can cause perching of water, resulting in poor drainage.

SOIL CLASSIFICATION - Typic Vitrandepts, medial/loamy, mixed, frigid; Andic Dystrachrepts, coarse-loamy, frigid; and Typic Haplumbrepts, coarse-loamy, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Well drained soils occur on ridges with poorly drained and umbric soils occupying draws, depressions, and lower slopes. Fragipans may occur in wet areas. Ash caps may be mixed and have sandy loam textures on ridges.

VEGETATIVE CHARACTERISTICS - This unit occurs in a transition zone with both western/pachistima and subalpine fir/pachistima and mensiesia habitat types on the well drained ridges with ferns, forbs, grasses, alder and other shrubs in the poorly drained draws and swales. Habitat types are combined because of the small number of mapping units.

MANAGEMENT CONSIDERATIONS

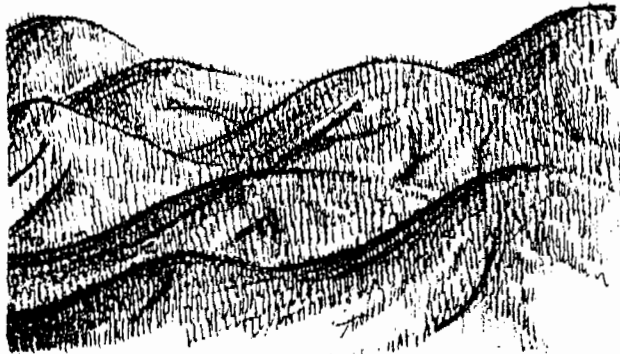
WATERSHED - Watershed interpretations reflect high subsoil erosion and high parent material erosion potentials. A major watershed objective should be to minimize the movement of eroded material into drainages.

ENGINEERING - Potential road construction problems are associated with wet draws and include high erosion rates in the excavated road prism with a moderate risk of sediment being delivered to streams. Cutbank and fill sloughing, as well as rapid brush encroachment, commonly require maintenance. The trafficability rating for road surfaces is poor. Cut and fill slopes are susceptible to the piping of water.

SILVICULTURE - This landtype has several silvicultural limitations relating to severe brush, grass or fern competition and dark colored (umbric) soils which often have high water tables making them difficult to regenerate. The volcanic ash topsoil is critical to the productivity of this landtype and skidding, site preparation, or slash disposal operations should avoid removal or displacement of this surface layer. Soil compaction or puddling can occur if equipment operates in wet draws.

POTENTIAL WILDLIFE HABITAT - This landtype has important properties associated with wildlife habitat including food, water, cover, and vegetative diversity. The vegetative mosaic patterns containing wet alder draws and swales with well drained timbered ridges is potential elk, deer, and fur bearer habitat. Summer habitat potential is rated high. Winter habitat is rated high in low elevation areas where snow accumulation does not limit access.

LANDTYPE 24-S10



SUMMARY

Number of map delineations - 189
Total acreage - 28,000
Average map unit acreage - 148

These units are located on low elevation, cool aspect moderate relief rolling uplands. Soils are deep, well drained and are developed in micaceous schist parent material. The habitat type is western red cedar/pachistima.

LANDFORM 24 MODERATE RELIEF ROLLING UPLANDS

Overall relief consists of rounded convex ridgetops and straight to concave sideslopes. Drainage patterns are dendritic and well developed.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 2,000 to 4,800 feet
- B. Slope Gradient - 20 to 40% including small areas up to 50% or greater
- C. Slope Shape - Compound with convex 30 to 90-foot wide ridgetops, slightly convex sideslopes and concave weakly V-shaped draws 20 to 60 feet wide.
- D. Overall Relief - 250 to 500 feet and occasionally up to 1,000 feet in large ridge system mapping units.
- E. Dissection Relief - 150 to 400 feet
- F. Dissection Density - 20 to 30 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Dendritic

STREAM DENSITY: 1-5 miles/mile²
MEAN: 3.25 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (85%)

CHANNEL TYPE: Fairly stable and moderately entrenched; low to moderate width/depth ratio; moderate energy; mostly graded.

SLOPE WATER MOVEMENT: Mostly subsurface with deep percolation and stream flow in established first-order stream channels. Water yield is well regulated.

SEDIMENT DELIVERY: Moderate with good storage capacity.

OTHER IMPORTANT CHARACTERISTICS: Streams are sensitive to increases in sediment and water yield, but such changes must usually be generated outside the unit. Water yield can be altered by vegetative management but it is regulated by the slopes.

PARENT MATERIAL GROUP

This group includes well weathered micaceous schists and gneisses with interbedded pegmatites of the [unclear] Supergroup commonly referred to as the high grade metamorphics of the Border Zone.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,800 feet on low energy slopes. Soil profiles are 60+ inches deep. Surface soil is volcanic ash 7 to 22 inches thick. Subsurface soil is medium textured with 10 to 40% rock fragments and an estimated 10 to 20% mica content.

TYPICAL SOIL PROFILES

(Soil 1)

Surface Soil - 0 to 14" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 7 to 22" thick).

Subsoil - 14 to 31" brown sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 10 to 20% rock fragments (range 8 to 36" thick).

Substratum - 31 to 60"+ pale brown gravelly sandy loam, structureless, nonsticky, nonplastic, 10 to 30% rock fragments.

SOIL CLASSIFICATION - Andic Dystrachrepts, coarse-loamy, mixed frigid, and Typic Vitrandepts, medial/loamy, mixed, frigid.

(Soil 2)

Surface Soil - 0 to 12" dark yellowish brown silt loam with granular structure, very friable, slightly sticky, slightly plastic, (range 5 to 15" thick).

Subsoil - 12 to 27" dark yellowish brown silt loam to silty clay loam with medium subangular blocky structure, friable, slightly sticky, slightly plastic, (range 10 to 30" thick).

Substratum - 27 to 50"+ dark yellowish brown gravelly sandy loam, structureless, firm, nonsticky, nonplastic with 10 to 40% rock fragments.

SOIL CLASSIFICATION - Eutric Glossoboralf, fine-loamy, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Heavier textured subsoils occur in moist draws and depressions. These finer textured soils have clay loam subsoils.

VEGETATIVE CHARACTERISTICS - The dominant habitat types are western red cedar/pachistima (THPL/PAMY) and grand fir/pachistima (ABGR/PAMY), and western hemlock/pachistima (TSHE/PAMY) on the west end of the Palouse District.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect low to moderate potential hazard ratings.

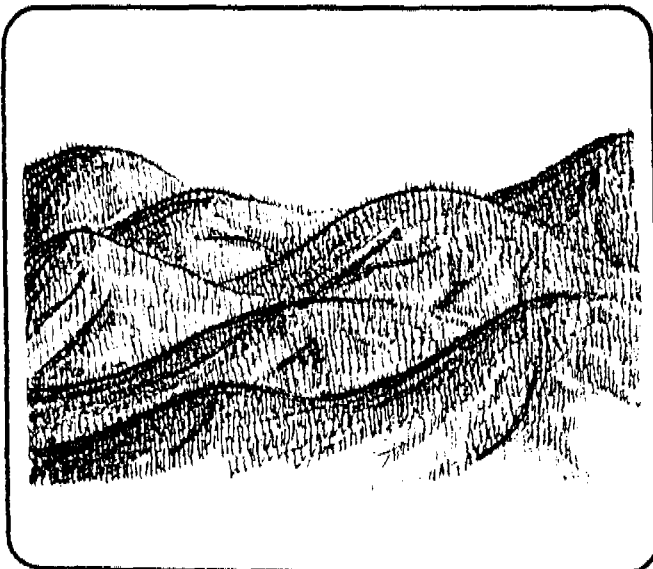
ENGINEERING - No significant road construction problems are associated with this landtype. Cutbank and fill sloughing are common maintenance problems. Finer textured soils in draws are subject to rutting and erosion if exposed to heavy traffic when wet.

SILVICULTURE - These soils are above average in productivity due to favorable moisture holding and fertility characteristics. Levels of productivity can be maintained by avoiding operations which remove or displace the ash surface soil. This landtype has very few silvicultural limitations.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate in potential for summer habitat. Winter range potential is rated moderate at low elevations where snow accumulation does not limit access.



LANDTYPE 24-S20



SUMMARY

Number of map delineations - 178
Total acreage - 11,700
Average map unit acreage - 66

These units are located on low elevation, warm aspect, moderate relief rolling uplands. Soils are deep, well drained, and are developed in micaceous schist parent material. The habitat type is western red cedar/pachistima.

LANDFORM 24 MODERATE RELIEF ROLLING UPLANDS

Overall relief consists of rounded convex ridgetops and straight to concave sideslopes. Drainage patterns are dendritic and well developed.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 2,000 to 4,800 feet
- B. Slope Gradient - 20 to 40% including small areas up to 50% or greater
- C. Slope Shape - Compound with convex 30 to 90-foot wide ridgetops, slightly convex sideslopes and concave weakly V-shaped draws 20 to 60 feet wide.
- D. Overall Relief - 250 to 500 feet and occasionally up to 1,000 feet in large ridge system mapping units.
- E. Dissection Relief - 150 to 400 feet
- F. Dissection Density - 20 to 30 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Dendritic

STREAM DENSITY: 1-5 miles/mile²
MEAN: 3.25 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (85%)

CHANNEL TYPE: Fairly stable and moderately entrenched; low to moderate width/depth ratio; moderate energy; mostly graded.

SLOPE WATER MOVEMENT: Mostly subsurface with deep percolation and stream flow in established first-order stream channels. Water yield is well regulated.

SEDIMENT DELIVERY: Moderate with good storage capacity.

OTHER IMPORTANT CHARACTERISTICS: Streams are sensitive to increases in sediment and water yield, but such changes must usually be generated outside the unit. Water yield can be altered by vegetative management but it is regulated by the slopes.

PARENT MATERIAL GROUP

Well weathered micaceous schists and gneisses with intruded pegmatites of the Belt Supergroup. On the Palouse District, there are St. Regis schist, Prichard schist, and Wallace schist.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,800 feet on high energy slopes. Soil profiles are 60+ inches deep. Surface soil is volcanic ash 7 to 20 inches thick. Subsurface soil is medium to coarse textured with 10 to 30% rock fragments, and an estimated 10 to 20% mica content.

TYPICAL SOIL PROFILES

(Soil 1)

Surface Soil - 0 to 14" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 7 to 20" thick).

Subsoil - 14 to 31" brown sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 10 to 20% rock fragments (range 8 to 36" thick).

Substratum - 31 to 60"+ pale brown gravelly sandy loam, structureless, nonsticky, nonplastic, 10 to 30% rock fragments.

SOIL CLASSIFICATION - Andic Dystrachrepts, coarse-loamy, mixed frigid, and Typic Vitrandepts, medial/loamy, mixed, frigid.

(Soil 2)

Surface Soil - 0 to 12" dark yellowish brown silt loam with granular structure, very friable, slightly sticky, slightly plastic, (range 5 to 15" thick).

Subsoil - 12 to 27" dark yellowish brown silt loam to silty clay loam with medium subangular blocky structure, friable, slightly sticky, slightly plastic, (range 10 to 30" thick).

Substratum - 27 to 50"+ dark yellowish brown gravelly sandy loam, structureless, firm, nonsticky, nonplastic with 10 to 40% rock fragments.

SOIL CLASSIFICATION - Eutric Glossoboralf, fine-loamy, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Small areas on the Palouse District and between Maggie Butte and Big Hill, on the Lochsa District, have significantly heavier subsoil textures than typical soils (clay loams vs. sandy loams). Thin droughty, skeletal soils with mixed or absent ash caps occur as inclusions on ridge points and harsh exposures. Soils with loam and silty clay loam subsoil textures occur in moist draws. There are occasional occurrences of subsoil fragipans on the Palouse District within this unit.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is western red cedar/pachistima (THPL/PAMY). There are inclusions of grand fir/pachistima (ABGR/PAMY) on steep south to west facing slopes.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect low to moderate hazard ratings.

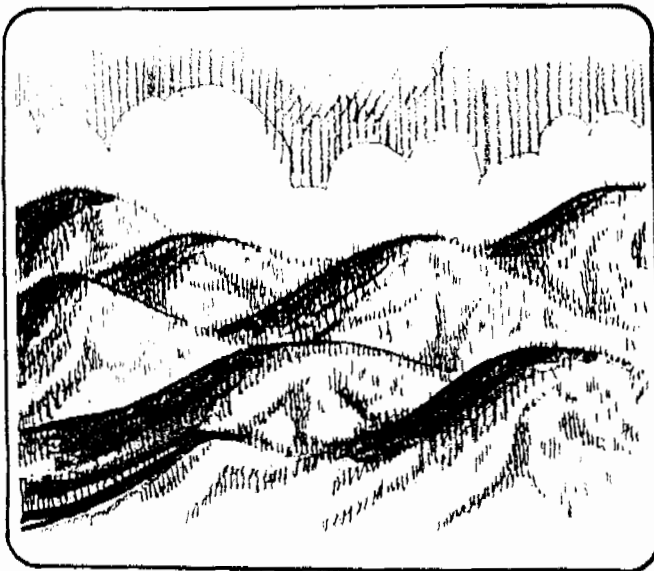
ENGINEERING - No significant road construction problems are associated with this landtype. Cutbank and flit sloughing are common maintenance problems. Finer textured soils in draws are subject to rutting and erosion if exposed to heavy traffic when wet.

SILVICULTURE - These soils are above average in productivity due to favorable moisture holding and fertility characteristics. This productivity can be maintained by avoiding operations which remove or displace the ash surface soil. There are very few silvicultural regeneration limitations for this landtype. Moderate intensity insolation rates may result in unfavorable conditions for seedlings on steeper southerly slopes.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate in potential for summer habitat. Winter range potential is rated moderate at low elevations where snow accumulation does not limit access.



LANDTYPE 24-S25



SUMMARY

Number of map delineations - 41
Total acreage - 9,600
Average map unit acreage - 234

These units are located on low elevation, warm aspect moderate relief rolling uplands on the Palouse District. Soils are deep, somewhat excessively drained, and are developed in micaceous schist parent material. The habitat type is grand fir/pachistima.

LANDFORM 24 MODERATE RELIEF ROLLING UPLANDS

Overall relief consists of rounded convex ridgetops and straight to concave sideslopes. Drainage patterns are dendritic and well developed.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 2,000 to 4,000 feet
- B. Slope Gradient - 20 to 40%
- C. Slope Shape - Compound with convex 30 to 90-foot wide ridgetops, slightly convex sideslopes and concave weakly V-shaped draws 20 to 60 feet wide.
- D. Overall Relief - 250 to 500 feet and occasionally up to 1,000 feet in large ridge system mapping units.
- E. Dissection Relief - 150 to 400 feet
- F. Dissection Density - 20 to 30 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Dendritic

STREAM DENSITY: 1-5 miles/mile²
MEAN: 3.25 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (85%)

CHANNEL TYPE: Fairly stable and moderately entrenched; low to moderate width/depth ratio; moderate energy; mostly graded.

SLOPE WATER MOVEMENT: Mostly subsurface with deep percolation and stream flow in established first-order stream channels. Water yield is well regulated.

SEDIMENT DELIVERY: Moderate with good storage capacity.

OTHER IMPORTANT CHARACTERISTICS: Streams are sensitive to increases in sediment and water yield, but such changes must usually be generated outside the unit. Water yield can be altered by vegetative management but it is regulated by the slopes.

PARENT MATERIAL GROUP

These are well weathered Wallace schists of the Belt Supergroup of metasediments.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations from 2000 to 4,000 feet on high energy slopes. Soil profiles are 48+ inches deep and tend to be droughty. Surface soil is volcanic ash 5 to 10 inches thick. Subsurface soil is coarse textured with 10 to 30% rock fragments and an estimated 10 to 20% mica content.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 8" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 5 to 10" thick).

Subsoil - 8 to 28" dark brown silt loam with weak subangular blocky structure, nonsticky, nonplastic, 10 to 20% rock fragments, (range 8 to 36" thick).

Substratum - 28 to 60"+ pale brown gravelly sandy loam, structureless, nonsticky, nonplastic, 10 to 30% rock fragments.

SOIL CLASSIFICATION - Andic Xerochrept and Andic Dystric Xerochrepts, coarse-loamy, mixed, frigid, families.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - The soil type listed above encompasses most of this landtype. Similar soils are those with volcanic ash caps less than 7 inches thick, soils with greater than 35% rock fragments, and some soils with slight accumulations of clay in the subsoils. Contrasting inclusions are soils on terrace remnants and very stable gentle surfaces with slight cementation to fragipans. Some soils along drainages are wet. Some soils on north to east microsities are more moist and support western red cedar habitat types.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is grand fir/pachistima (ABGR/PAMY) on the wet end.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect low to moderate potential hazard ratings.

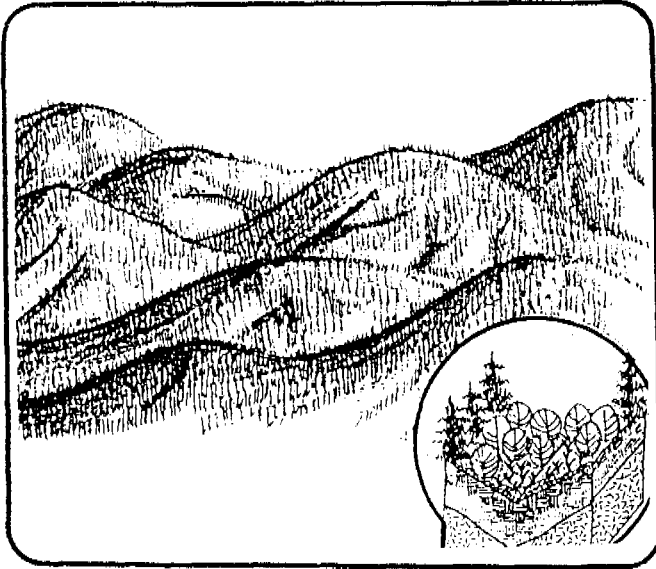
ENGINEERING - No significant road construction problems are associated with this landtype. Cutbank and fill sloughing are common maintenance problems. Finer textured soils in draws are subject to rutting and erosion if exposed to heavy traffic when wet.

SILVICULTURE - This landtype has regeneration limitations related to droughty soil, thin or mixed ash surfaces, and brush competition. Solar insolation can be a problem on southerly slopes.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate in potential for summer habitat. Winter range potential is rated moderate at low elevations where snow accumulation does not limit access.



LANDTYPE 24-S45



SUMMARY

Number of map delineations - 50
Total acreage - 5,000
Average map unit acreage - 100

These units are located on low elevation, moderate relief rolling uplands. Soils are well drained on ridges, poorly drained in draws and have deep profiles developed in micaceous schist parent material. The habitat type is western red cedar/pachistima with riparian vegetation in wet draws.

LANDFORM 24 MODERATE RELIEF ROLLING UPLANDS

Overall relief consists of rounded convex ridgetops and straight to concave sideslopes. Drainage patterns are dendritic and well developed.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 4,000 to 4,800 feet
- B. Slope Gradient - 20 to 40%
- C. Slope Shape - Compound with convex 30 to 90-foot wide ridgetops, slightly convex sideslopes and concave weakly V-shaped draws 20 to 60 feet wide.
- D. Overall Relief - 250 to 500 feet and occasionally up to 1,000 feet in large ridge system mapping units.
- E. Dissection Relief - 50 to 200 feet
- F. Dissection Density - 20 to 30 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Dendritic

STREAM DENSITY: 1-5 miles/mile²
MEAN: 3.25 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (85%)

CHANNEL TYPE: Channel banks and beds are poorly defined and contain higher proportions of fine.

SLOPE WATER MOVEMENT: Water movement in draws and swales is subsurface with frequent springs, seeps, and bogs. Interfluvies are well drained with significant subsurface flows.

SEDIMENT DELIVERY: Moderate with good storage capacity.

OTHER IMPORTANT CHARACTERISTICS: Streams are sensitive to increases in sediment and water yield, but such changes must usually be generated outside the unit. Water yield can be altered by vegetative management but it is regulated by the slopes.

PARENT MATERIAL GROUP

This group includes well weathered micaceous schists, gneisses, and interbedded pegmatites of the Belt Supergroup, commonly referred to as high grade metamorphics of the Border Zone.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,800 feet on all aspect slopes. Soil profiles are 60+ inches deep. Well drained ridge soils have a volcanic ash surface 8 to 28 inches thick. Poorly drained draw soils have a darkened, modified volcanic ash surface 5 to 13 inches thick. Subsurface soil is medium to coarse textured with 10 to 35% rock fragments and an estimated 10 to 20% mica content. Naturally dense fragipan layers may occur in wet draws.

TYPICAL SOIL PROFILES

(Well drained soil)

Surface Soil - 0 to 15" dark brown silt loam with weak granular structure, nonsticky, nonplastic (range 8 to 28" thick).

Subsoil - 15 to 35" brown gravelly sandy loam - loam with weak subangular blocky structure, slightly sticky, nonplastic, 10 to 35% rock fragments, (range 12 to 40" thick).

Substratum - 35 to 60"+ pale brown gravelly sandy loam, structureless, nonsticky, nonplastic, 10 to 40% rock fragments.

(Poorly drained soil)

Surface Soil - 0 to 7" very dark brown silt loam with weak subangular blocky structure, nonsticky, nonplastic, 10 to 15% rock fragments (range 15 to 31" thick).*

Subsoil - 7 to 24" dark greyish brown gravelly silt loam or loam with weak subangular blocky structure, nonsticky, nonplastic, 20 to 35% rock fragments, (range 10 to 26" thick).

Substratum - 24 to 60"+ pale brown gravelly sandy loam, structureless, nonsticky, nonplastic, 20 to 35% rock fragments.*

*NOTE: These horizons may have a naturally dense (fragipan) characteristic which can cause perching of water, resulting in poor drainage.

SOIL CLASSIFICATION - Eutric Glossoboralfs, fine-loamy, mixed, frigid; Andic Dystrochrepts, coarse-loamy, mixed, frigid; Typic Vitrandepts, medial/loamy, mixed, frigid; and Andic Haplumbrepts, fine-loamy, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Poorly drained draws have subsoils ranging from loam to silty clay loam in texture. Soils with thin or mixed ash caps may occur on ridge points and harsh inclusions.

VEGETATIVE CHARACTERISTICS - The dominant habitat type on well drained ridges is western red cedar/pachistima (THPL/PAMY). Poorly drained draws have alder, fern, and sedge with a scattered western red cedar overstory.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect low to moderate potential hazard ratings. Heavy equipment operations in wet draws can cause rutting and severe erosion into drainages.

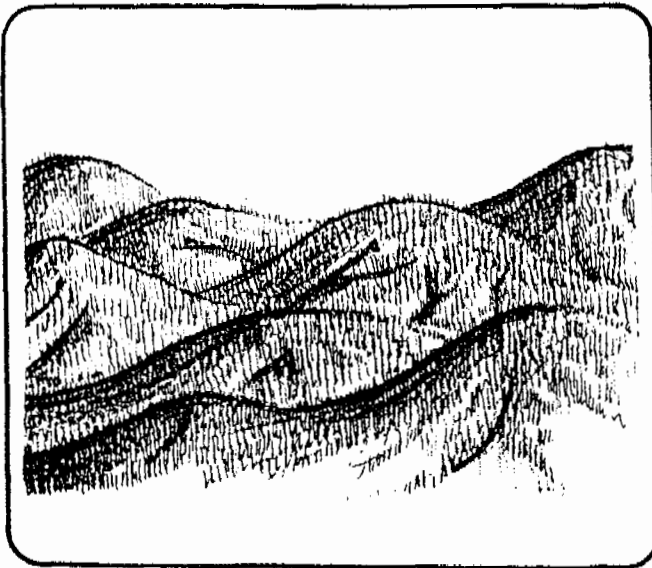
ENGINEERING - Potential road construction problems are those associated with wet draws. Cutbank and fill sloughing and rapid brush encroachment are common maintenance problems. Finer textured soils associated with draws are subject to rutting and erosion if exposed to heavy traffic when wet.

SILVICULTURE - Regeneration limitations for this landtype are related to the severe brush competition, high water tables, and dark colored umbric soils which occur in draws. Soil compaction potential is rated high for this unit in wet areas which are susceptible to damage by heavy equipment. Well drained soils are highly productive and have no major regeneration limitations.

POTENTIAL WILDLIFE HABITAT - This landtype is rated high in potential for summer habitat because of abundant food, water, cover, and diversity. Winter habitat potential is rated high at lower elevations where snow accumulation does not limit access.



LANDTYPE 24-T01



SUMMARY

Number of map delineations - 18
Total acreage - 1,800
Average map unit acreage - 100

These units are located on low elevation, moderate relief uplands south and east of Elk River. They occur on all aspects. Soils are moderately deep to deep, well drained, and are developed in basalt parent material. The habitat type is western red cedar/pachistima.

LANDFORM 24 MODERATE RELIEF ROLLING UPLANDS

Overall relief consists of rounded convex ridgetops and straight to concave sideslopes. Drainage patterns are dendritic and well developed.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 2,000 to 3,600 feet
- B. Slope Gradient - 20 to 40%
- C. Slope Shape - Compound with convex 30 to 90-foot wide ridgetops, slightly convex sideslopes and concave weakly V-shaped draws 20 to 60 feet wide.
- D. Overall Relief - 250 to 500 feet and occasionally up to 1,000 feet in large ridge system mapping units.
- E. Dissection Relief - 50 to 200 feet
- F. Dissection Density - 20 to 30 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Dendritic

STREAM DENSITY: 1-5 miles/mile²
MEAN: 3.25 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (85%)

CHANNEL TYPE: Fairly stable and moderately entrenched; low to moderate width/depth ratio; moderate energy; mostly graded.

SLOPE WATER MOVEMENT: Mostly subsurface with deep percolation and stream flow in established first-order stream channels. Water yield is well regulated.

SEDIMENT DELIVERY: Moderate with good storage capacity.

OTHER IMPORTANT CHARACTERISTICS: Streams are sensitive to increases in sediment and water yield, but such changes must usually be generated outside the unit. Water yield can be altered by vegetative management but it is regulated by the slopes.

PARENT MATERIAL GROUP

This group includes Columbia River basalts and associated basalts, tuffs, and breccia.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 3,600 feet on the highest remnant positions of the Columbia River Basalt Plateau or as dikes of harder basalt protruding above the plateau. Soil profiles are 40+ inches deep and stoney. Surface soil is volcanic ash 7 to 20 inches thick. Subsurface soil is fine textured with 20 to 50% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 11" dark brown silt loam (volcanic ash) with moderate granular structure, very friable, slightly sticky, slightly plastic, (range 7 to 20" thick).

Subsoil (1) - 11 to 32" dark brown gravelly silt loam with moderate subangular blocky structure, friable, slightly sticky, slightly plastic, 15 to 30% rock fragments, (range 10 to 30" thick).

Subsoil (2) - 32 to 60" dark brown very gravelly silt loam to clay loam with moderate subangular blocky structure, friable, sticky, plastic, many clay films lining pores and ped faces, 40 to 80% rock fragments.

Substratum - The soil usually rests on moderately weathered fractured basalt.

SOIL CLASSIFICATION - Eutric Glossoboralf, fine-loamy, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - This dominantly rocky soil varies from 40 to 100 inches thick. Volcanic ash depth varies widely, but is mostly in the 7 to 14 inch range. Percent rock fragments varies from 15 to 90%. This unit includes up to 20% soils on gentle slopes and plateau remnants which are very deep, silty, and moderately well drained, (like those of 22-T01). In addition, there are soils which are less than 40 inches to basalt bedrock, and wet soils along drainages.

VEGETATIVE CHARACTERISTICS - Vegetation is dominantly western red cedar/pachistima (THPL/PAMY) with a few inclusions of grand fir (ABGR/PAMY).

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect low to moderate potential hazard ratings.

ENGINEERING - No significant road construction problems are associated with this landtype. Cutbank sloughing and road surface rutting are common maintenance problems.

SILVICULTURE - This landtype may have regeneration limitations where the ash surface soil is mixed or thin (less than 7" thick).

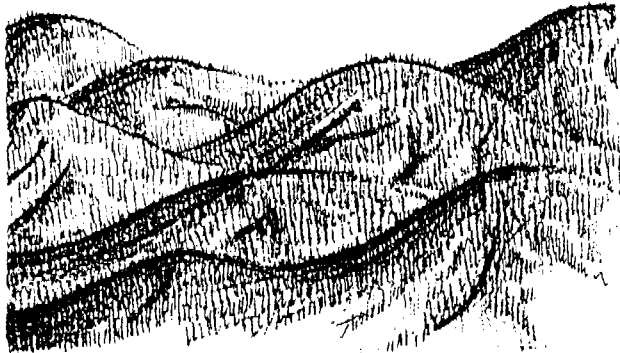
POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate in potential for summer habitat. Winter range potential is rated moderate at low elevations where snow accumulation does not limit access.



T-103

185

LANDTYPE 24-T11



SUMMARY

Number of map delineations - 22
Total acreage - 700
Average map unit acreage - 32

These units are located on low elevation, cool aspect, moderate relief rolling uplands. Soils are deep, moderately well to well drained, and are developed in basalt parent material. Naturally dense (fragipan) layers may be present. The habitat type is western red cedar/pachistima.

LANDFORM 24 MODERATE RELIEF ROLLING UPLANDS

Overall relief consists of rounded convex ridges and straight to concave sideslopes. Drainage patterns are dendritic and well developed.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 2,000 to 3,600 feet
- B. Slope Gradient - 20 to 40%
- C. Slope Shape - Compound with convex 30 to 90-foot wide ridgetops, slightly convex sideslopes, and concave weakly V-shaped draws 20 to 60 feet wide
- D. Overall Relief - 250 to 500 feet and occasionally up to 1,000 feet in large ridge systems mapping units
- E. Dissection Relief - 50 to 200 feet
- F. Dissection Density - 20 to 30 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Dendritic

STREAM DENSITY: 1-5 miles/mile²
MEAN: 3.25 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (85%)

CHANNEL TYPE: Fairly stable and moderately entrenched; low to moderate width/depth ratio; moderate energy; mostly graded.

SLOPE WATER MOVEMENT: Mostly subsurface with deep percolation and stream flow in established first-order stream channels. Water yield is well regulated.

SEDIMENT DELIVERY: Moderate with good storage capacity.

OTHER IMPORTANT CHARACTERISTICS: Streams are sensitive to increases in sediment and water yield, but such changes must usually be generated outside the unit. Water yield can be altered by vegetative management but it is regulated by the slopes.

PARENT MATERIAL GROUP

This group includes basalts from the Columbia River Plateau flows. The Palouse District has deep accumulations of silty material derived from Palouse loess and Mazama volcanic ash.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 3,600 feet on low energy slopes. Soil profiles are 60+ inches deep. Surface soil is volcanic ash 7 to 24 inches thick. Subsurface soil is fine textured with 20 to 50% rock fragments. Naturally dense subsoil layers may be present.

TYPICAL SOIL PROFILES

(Soil 1 & 2)

Surface Soil - 0 to 16" dark brown silt loam with moderate granular structure, very friable, slightly sticky, slightly plastic, (range 7 to 24" thick).

Subsoil (1) - 16 to 35" dark brown silt loam with moderate subangular blocky structure, friable, slightly sticky, slightly plastic, (range 10 to 40" thick).

Subsoil (2) - 35 to 71" dark brown silt loam to silty clay loam. Silt loam soils tend to have firm, brittle (fragipan) characteristics. Silty clay loam soils are firm, sticky, plastic, and contain 10 to 20% gravel.

Substratum - These soils generally continue with depth through a series of old buried soils similar to the horizon above.

SOIL CLASSIFICATION - Andeptic Paleboralfs, medial/loamy, mixed, frigid, with and without fragipan.

(Soil 3)

Surface Soil - 0 to 12" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 7 to 24" thick).

Subsoil - 24 to 40" reddish brown, gravelly, silty clay loam with moderate angular blocky structure, sticky, plastic, 20 to 45% rock fragments.

Substratum - 40 to 60+ light reddish brown, gravelly, silty clay loam, massive, sticky, plastic, 30 to 50% rock fragments.

SOIL CLASSIFICATION - Eutric Glossoboralfs, loamy-skeletal, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - This unit has three major soils. Soils 1 and 2 occur on smooth slopes less than 30 to 40% and make up 60% of the unit, with a ratio of approximately 20% fragipans, 40% nonfragipans. Soil 3 occurs on steep dissected sideslopes on strongly convex positions. The pattern of fragipan occurrence is not predictable. Inclusions are 50% stoney soils, 5% wet soils along drainages, and 5% soils on steep south and west facing slopes which have grand fir/pachistima habitat types.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is western red cedar/pachistima (THPL/PAMY) with inclusions on steep southwest microsites of grand fir/pachistima (ABGR/PAMY).

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect low to moderate potential hazard ratings.

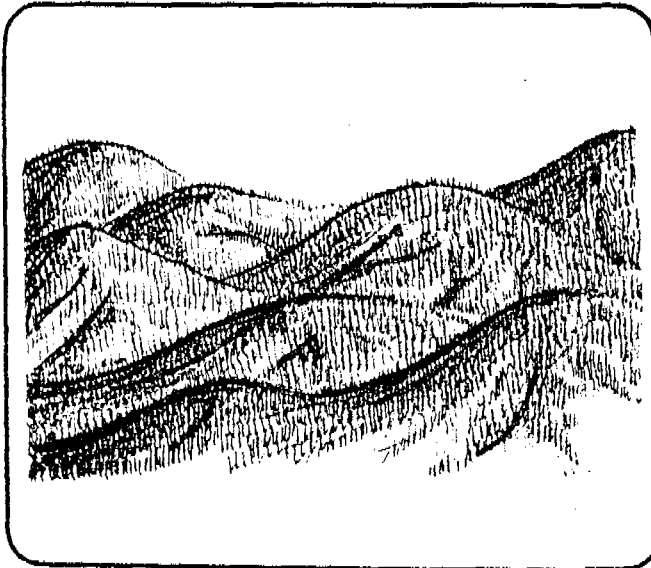
ENGINEERING - No significant road construction problems are associated with this landtype. Road surface rutting commonly requires maintenance.

SILVICULTURE - This landtype is among the most productive on the Forest. Soil fertility and moisture holding levels are very high. There are no major regeneration limitations for this unit.

POTENTIAL WILDLIFE HABITAT - This landtype is rated as having moderate potential for summer habitat. Where elevations are low enough to be accessible during periods of snow accumulation, winter habitat is rated moderate.



LANDTYPE 24-T21



SUMMARY

Number of map delineations - 43
Total acreage - 8,600
Average map unit acreage - 200

These units are located on low elevation, warm aspect, moderate relief rolling uplands. Soils are deep moderately well to well drained, and are developed in basalt, loess, and alluvium parent material. The habitat type is western red cedar/pachistima.

LANDFORM 24 MODERATE RELIEF ROLLING UPLANDS

Overall relief consists of rounded convex ridgetops and straight to concave sideslopes. Drainage patterns are dendritic and well developed.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 2,000 to 3,600 feet
- B. Slope Gradient - 20 to 40%
- C. Slope Shape - Compound with convex 30 to 90-foot wide ridgetops, slightly convex sideslopes and concave weakly V-shaped draws 20 to 60 feet wide.
- D. Overall Relief - 250 to 500 feet and occasionally up to 1,000 feet in large ridge system mapping units.
- E. Dissection Relief - 50 to 200 feet
- F. Dissection Density - 20 to 30 miles/mile²

DRAINAGE PATTERN: Dendritic

STREAM DENSITY: 1-5 miles/mile²
MEAN: 3.25 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (85%)

CHANNEL TYPE: Fairly stable and moderately entrenched; low to moderate width/depth ratio; moderate energy; mostly graded.

SLOPE WATER MOVEMENT: Mostly subsurface with deep percolation and stream flow in established first-order stream channels. Water yield is well regulated.

SEDIMENT DELIVERY: Moderate with good storage capacity.

OTHER IMPORTANT CHARACTERISTICS: Streams are sensitive to increases in sediment and water yield, but such changes must usually be generated outside the unit. Water yield can be altered by vegetative management but it is regulated by the slopes.

PARENT MATERIAL GROUP

This group includes Columbia River basalts with deep accumulations of silty material derived from Palouse loess and Mazama volcanic ash.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 3,600 feet on moderately high energy slopes. Soil profiles are 60+ inches deep, moderately well to well drained, and contrast in their characteristics. All surface soil is volcanic ash 7 to 20 inches thick. Subsurface soils vary from very gravelly medium fine textures and to fine textured silts with strong horizons of clay accumulation and some cementation (fragipan).

TYPICAL SOIL PROFILES

(Soils 1 & 2, see subsoil 2 for difference)

Surface Soil - 0 to 11" yellowish to reddish brown silt loam (volcanic ash) with moderate granular structure, very friable, slightly sticky, slightly plastic, (range 7 to 18" thick).

Subsoil (1) - 11 to 30" dark brown silt loam with moderate subangular blocky structure, friable, slightly sticky, slightly plastic, (range 10 to 40" thick).

Subsoil (2) - 30 to 60" strong brown silt loam to silty clay loam. The silt loam subsoil tends to have coarse prismatic structure which is very firm and brittle when moist (fragipan). The silty clay loam subsoil tends to have moderate prismatic structure which is firm but not brittle. Both are sticky and plastic and have moderately thick clay films lining pores and ped faces.

Substratum - These soils generally continue with depth as a series of buried soils similar to those described above. As some depth, they grade into weathered, fractured basalt.

SOIL CLASSIFICATION - Andeptic Paleboralfs, fine silty and coarse silty, mixed, frigid families, with and without fragipans.

(Soil 3)

Surface Soil - 0 to 11 inches dark brown silt loam with moderate granular structure, very friable, slightly sticky, slightly plastic, (range 7 to 20" thick).

Subsoil - 11 to 50" dark brown gravelly silt loam and clay loam with moderate subangular blocky structure, friable, sticky, plastic, 20 to 60% rock fragments.

Substratum - This is primarily weathered, fractured basalt.

SOIL CLASSIFICATION - Eutric Glossoboralfs, fine silty, coarse silty, and loamy-skeletal, mixed, frigid families.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - The three major soils occur as follows: The deep silty soil without fragipan, 35%; the deep silty soil with fragipan, 20%; the rocky soil on dissection sideslopes, greater than 35%. The depth of volcanic ash on these soils varies from 7 to 18 inches. Also included in this unit are wet soils along drainages and drier soils on south to west facing slopes with grand fir/pachistima habitat types.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is western red cedar/pachistima (THPL/PAMY), but on the dry end of the range. Included in this unit are 10 to 20% sites on steep south to west facing slopes with grand fir/pachistima (ABGR/PAMY).

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect low to moderate potential hazard ratings.

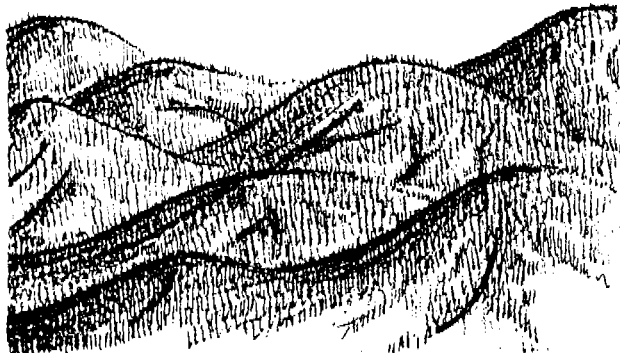
ENGINEERING - No significant road construction problems are associated with this landtype. Cutbank sloughing and road surface rutting are common maintenance problems.

SILVICULTURE - This landtype may have regeneration limitations where the ash surface is mixed or shallow (<7" thick). The soil compaction is rated high for this unit.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate in potential for summer habitat. Winter range potential is rated moderate at low elevations where snow accumulation does not limit access.



LANDTYPE 24-T25



SUMMARY

Number of map delineations - 20
Total acreage - 1,800
Average map unit acreage - 90

These units are located on low elevation, warm aspect, moderate relief rolling uplands on the west end of the Forest. Soils are moderately deep to deep, moderately well to well drained, silty to rocky, and developed in loess and basalt. The habitat type is grand fir/pachistima.

LANDFORM 24 MODERATE RELIEF ROLLING UPLANDS

Overall relief consists of rounded convex ridgetops and straight to concave sideslopes. Drainage patterns are dendritic and well developed.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 2,000 to 3,600 feet
- B. Slope Gradient - 20 to 40%
- C. Slope Shape - Compound with convex 30 to 90-foot wide ridgetops, slightly convex sideslopes and concave weakly V-shaped draws 20 to 60 feet wide.
- D. Overall Relief - 250 to 500 feet and occasionally up to 1,000 feet in large ridge system mapping units.
- E. Dissection Relief - 50 to 200 feet
- F. Dissection Density - 20 to 30 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Dendritic

STREAM DENSITY: 1-5 miles/mile²
MEAN: 3.25 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (85%)

CHANNEL TYPE: Fairly stable and moderately entrenched; low to moderate width/depth ratio; moderate energy; mostly graded.

SLOPE WATER MOVEMENT: Mostly subsurface with deep percolation and stream flow in established first-order stream channels. Water yield is well regulated.

SEDIMENT DELIVERY: Moderate with good storage capacity.

OTHER IMPORTANT CHARACTERISTICS: Streams are sensitive to increases in sediment and water yield, but such changes must usually be generated outside the unit. Water yield can be altered by vegetative management but it is regulated by the slopes.

PARENT MATERIAL GROUP

This group consists of Columbia River basalts with deep accumulations of silty material derived from Palouse loess and Mazama volcanic ash.

SOIL-VEGETATION UNIT

This unit occurs at elevations below 3,600 feet on high energy slopes. Soil profiles are 40+ inches deep, moderately well to well drained, and contrast in their characteristics. All surface soils are silty, 5 to 15 inches thick with accumulation of organic matter and volcanic ash influence. Subsurface soils vary from very rocky, medium fine textured and uniform, to fine textured silts with strong horizons of clay accumulation and cementation (fragipans).

TYPICAL SOIL PROFILES

(Soils 1 & 2, see Subsoil 2 for difference)

Surface Soil - 0 to 11" dark brown silt loam (volcanic ash influenced), with moderate granular structure, very friable, slightly sticky, slightly plastic, (range 5 to 15" thick).

Subsoil (1) - 11 to 24" dark yellowish brown silt loam with moderate subangular blocky structure, friable, slightly sticky, slightly plastic, (range 10 to 40" thick).

Subsoil (2) - 34 to 60"+ yellowish brown to brown silt loam to silty clay loam. Silt loam subsoils tend to have coarse prismatic structure which is very firm and brittle when moist (fragipan). Silty clay loam subsoils tend to have moderate prismatic structure which is firm (not brittle). Both are sticky and plastic with moderately thick clay films lining pores and ped faces and less than 10% rock fragments.

Substratum - These soils generally continue with depth as a series of buried soils similar to those described above. At some depth, they grade into weathered fractured basalt.

SOIL CLASSIFICATION - Andeptic Paleboralfs and Fragic Haploxeralfs, coarse-silty, and fine-silty, mixed, frigid families.

(Soil 3)

Surface Soil - 0 to 3" very dark brown silt loam, moderate granular structure, friable, nonsticky, slightly plastic, 10 to 20% rock fragments (range 0 to 10" thick).

Subsoil - 3 to 30" brown very gravelly loam, medium granular structure, friable, sticky, plastic, clay films lining pores and ped faces, 50 to 90% rock fragments, (range 10 to 50" thick).

Substratum - 30 to 40"+ strong brown very gravelly clay as soil material removed from cracks in fractured basalt. Massive structure, firm, very sticky, very plastic, clay films lining pores and ped faces and rock fragments, 80 to 95% basalt cobbles.

SOIL CLASSIFICATION - Ultic Haploxeralf, loamy-skeletal, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Soils one and two occur in an unpredictable pattern on all slopes less than 40%. Generally the nonfragipan soil dominates (40%) and occurs on steep slopes where dissection has led to clay influence from the weathered basalt. The fragipan soils generally occur on remnant positions where loess dominates. The depth of volcanic ash on these soils vary from 0 to 15 inches. Also included in this unit are wet soils along drainages, some soils which are less than 20 inches to bedrock on sharp ridges and shoulders and less than 1% rock outcrop.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is grand fir/pachistima (ABGR/PAMY). Included in this unit are north to east facing microsities which support western red cedar/pachistima (THPL/PAMY) and steep south to west facing microsities which support Douglas-fir/ninebark (PSME/PHMA) or even permanent grassland.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect low to moderate potential hazard ratings.

ENGINEERING - No significant road construction problems are associated with this landtype. Cutbank sloughing and road surface rutting are common maintenance problems.

SILVICULTURE - Major regeneration limitations include droughty soils, possible mixed ash caps, and high insolation rates. Both surface and subsurface soil compaction hazard ratings are high.

POTENTIAL WILDLIFE HABITAT - Potential summer habitat is rated moderate. Potential winter habitat is rated moderate at lower elevations where snow accumulations do not limit access.

LANDTYPE 24-U26



SUMMARY

Number of map delineations - 63
Total acreage - 5,400
Average map unit acreage - 86

These units are located on low elevation, warm aspect, moderate relief, rolling uplands. Soils are moderately deep to deep, well to somewhat excessively well drained, and developed in various parent material. The habitat type is dominated by grand fir/pachistima.

LANDFORM 24 MODERATE RELIEF ROLLING UPLANDS

Overall relief consists of rounded convex ridgetops and straight to concave sideslopes. Drainage patterns are dendritic and well developed.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 1,600 to 4,500 feet
- B. Slope Gradient - 20 to 40%
- C. Slope Shape - Compound with convex 30 to 90-foot wide ridgetops, slightly convex sideslopes and concave weakly V-shaped draws 20 to 60 feet wide.
- D. Overall Relief - 250 to 500 feet and occasionally up to 1,000 feet in large ridge system mapping units.
- E. Dissection Relief - 50 to 200 feet
- F. Dissection Density - 20 to 30 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Dendritic

STREAM DENSITY: 1-5 miles/mile²
MEAN:

PRIMARY STREAM ORDER: 1 and 2

CHANNEL TYPE: Fairly stable and moderately entrenched; low to moderate width/depth ratio; moderate energy; mostly graded.

SLOPE WATER MOVEMENT: Overland flow is common on portions with thin soils. Weakly expressed dissections often support intermittent streams. Stream flow tends to respond rapidly to events due to hard bedrock.

SEDIMENT DELIVERY: Moderate with good storage capacity.

OTHER IMPORTANT CHARACTERISTICS: Streams are sensitive to increases in sediment and water yield, but such changes must usually be generated outside the unit. Water yield can be altered by vegetative management but it is regulated by the slopes.

PARENT MATERIAL GROUP

This group includes Libby siltite, Striped Peak quartzite, Wallace gneisses and Palouse loesses. All are moderately to weakly weathered.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,500 feet on high energy slopes. Soil profiles are generally less than 48 inches deep and tend to be droughty. Surface soil is mixed volcanic ash 3 to 10 inches thick. Subsurface soil is coarse textured with 30 to 60% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 5" dark brown silt loam to sandy loam with weak granular structure, nonsticky, nonplastic, (range 3 to 10" thick).

Subsoil - 6 to 20" gravelly sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 30 to 60% rock fragments, (range 10 to 40" thick).

Substratum - 20 to 48"+ pale brown gravelly sandy loam to loamy sand, structureless, nonsticky, nonplastic, 30 to 60% rock fragments.

SOIL CLASSIFICATION - Dystric Xerochrepts and Andic Dystrichrepts, loamy-skeletal, mixed, frigid, Families.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Thinner soils occur on upper slopes of finger ridges (interfluvies) where ash caps are mixed or missing. Deep colluvial soils occur in draws and swales. Ash caps are mixed but usually less than 12 inches deep. These units consist of approximately 65% skeletal soils and 35% nonskeletal soils.

VEGETATIVE CHARACTERISTICS - The dominant habitat types are grand fir/pachistima (ABGR/PAMY) on drier ridges and sideslopes, with western red cedar/pachistima (THPL/PAMY) in moist draws.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect low to moderate potential hazard ratings.

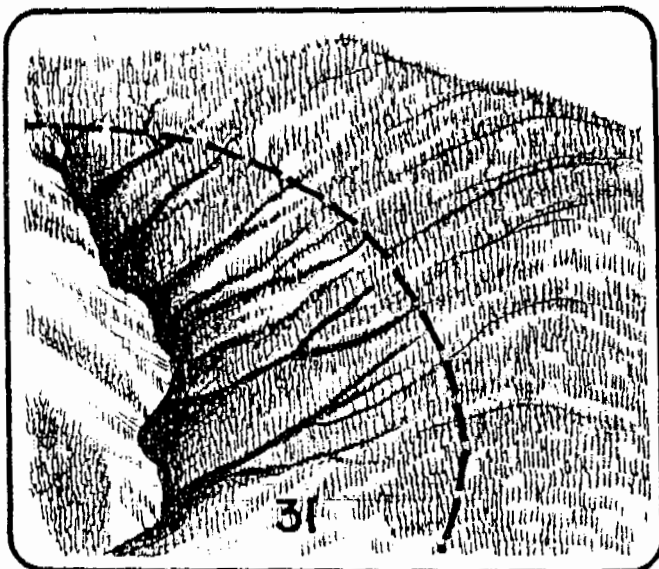
ENGINEERING - No significant road construction problems are associated with this landtype. Dry cutbank raveling is a common maintenance problem. Revegetation of cutbanks and fills is difficult.

SILVICULTURE - This landtype has regeneration limitations related to shallow ash surface soils, droughty conditions and brush competition.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate in potential for summer habitat. Winter range potential is rated moderate at low elevations where snow accumulation does not limit access.



LANDTYPE 31-G10



SUMMARY

Number of map delineations - 359
Total acreage - 22,700
Average map unit acreage - 63

These units are located on low elevation, cool aspect, mountain slopelands. Soils are deep, well drained, and are developed in granitic parent material. The habitat type is western red cedar/pachistima.

LANDFORM 31 MOUNTAIN SLOPELANDS

Overall relief consists of lower and midslopes of mountains and primary ridges along major drainages. Slope shapes range from straight to slightly convex-concave. Slopes are generally dissected with V-shaped draws. The drainage system has a trellis pattern.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 1,600 to 4,800 feet
- B. Slope Gradient - 30 to 60% with averages near 50%
- C. Slope Shape - Straight to slightly concave or convex
- D. Overall Relief - 500 to 1,000 feet
- E. Dissection Spacing - 500 to 1,500 feet
- F. Dissection Relief - 100 to 300 feet
- G. Dissection Density - 10 to 25 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Straight to occasionally branched dendritic with seeps and springs common forming stream heads.

STREAM DENSITY: 1-5 miles/mile²
MEAN: 3.75 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (81%)

CHANNEL TYPE: Entrenched V-channels with moderate to high energy; angular gravel-cobble substrate, good stability.

SLOPE WATER MOVEMENT: Water movement is both subsurface and surface stream flow with weak regulation; movement is rapid. Subsurface water concentrations are common on lower third of slopes.

SEDIMENT DELIVERY: Moderate on slopes, moderate to high in streams. Storage is moderate.

OTHER IMPORTANT CHARACTERISTICS: Stream channels are sensitive to debris damming and sediment loading and are subject to torrents. Snow and vegetative management can significantly alter water yields.

PARENT MATERIAL GROUP

This group includes moderately weathered granites and associated gneisses from the Idaho Batholith.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,800 feet on low energy slopes. Soil profiles are 60+ inches deep. Surface soil is volcanic ash 7 to 28 inches thick. Subsurface soil is coarse textured with 20 to 50% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 18" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 8 to 28" thick).

Subsoil - 18 to 38" brown gravelly sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 20 to 50% rock fragments, (range 12 to 30" thick).

Substratum - 38 to 60"+ pale brown gravelly sandy loam - loamy sand, structureless, nonsticky, nonplastic, 20 to 50% rock fragments.

SOIL CLASSIFICATION - Typic Vitrandepts, medial/loamy, skeletal, mixed, frigid and Andic Dystrochrepts, coarse-loamy, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - The major variation is ash cap depth and degree of mixing with subsoils. Soils with finer textured subsoils (Alfisol) occur as inclusions in moist draws. Soils with grussic (sandy) parent materials occur as inclusions. Approximately 50% of the soils in this unit are skeletal, and 50% are nonskeletal.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is western red cedar/pachistima (THPL/PAMY).

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a high sediment delivery efficiency rating, Other hazard ratings are low to moderate.

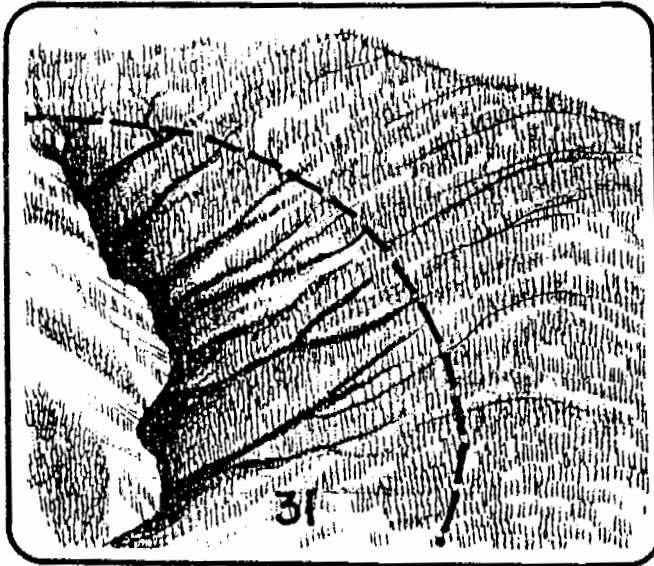
ENGINEERING - Potential road construction problems include a high sediment delivery efficiency, moderate mass wasting, and road prism erosion hazards as a source of sediment. Cutbank raveling is the major maintenance problem.

SILVICULTURE - This landtype has no major silvicultural regeneration limitations.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate in potential for summer habitat. Winter range potential is rated moderate at low elevations where snow accumulation does not limit access.



LANDTYPE 31-G20



SUMMARY

Number of map delineations - 443
Total acreage - 33,500
Average map unit acreage - 76

These units are located on low elevation, warm aspect mountain slopelands. Soils are deep, well drained, and are developed in granitic parent material. The habitat type is western red cedar/pachistima.

LANDFORM 31 MOUNTAIN SLOPELANDS

Overall relief consists of lower and midslopes of mountains and primary ridges along major drainages. Slope shapes range from straight to slightly convex-concave. Slopes are generally dissected with V-shaped draws. The drainage system has a trellis pattern.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 1,600 to 4,800 feet
- B. Slope Gradient - 30 to 60% with averages near 50%
- C. Slope Shape - Straight to slightly concave or convex
- D. Overall Relief - 500 to 1,000 feet
- E. Dissection Spacing - 500 to 1,500 feet
- F. Dissection Relief - 100 to 300 feet
- G. Dissection Density - 10 to 25 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Straight to occasionally branched dendritic with seeps and springs common forming stream heads.

STREAM DENSITY: 1-5 miles/mile²
MEAN: 3.75 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (81%)

CHANNEL TYPE: Entrenched V-channels with moderate to high energy; angular gravel-cobble substrate, good stability.

SLOPE WATER MOVEMENT: Water movement is both subsurface and surface stream flow with weak regulation; movement is rapid. Subsurface water concentrations are common on lower third of slopes.

SEDIMENT DELIVERY: Moderate on slopes, moderate to high in streams. Storage is moderate.

OTHER IMPORTANT CHARACTERISTICS: Stream channels are sensitive to debris damming and sediment loading and are subject to torrents. Snow and vegetative management can significantly alter water yields.

PARENT MATERIAL GROUP

This group includes moderately weathered granitics and associated gneisses of the Idaho Batholith.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,800 feet on high energy slopes. Soil profiles are 60+ inches deep. Surface soil is volcanic ash 7 to 18 inches thick. Subsurface soil is coarse textured with 20 to 50% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 12" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 7 to 18" thick).

Subsoils - 12 to 38" brown gravelly sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 20 to 50% rock fragments, (range 16 to 33" thick).

Substratum - 38 to 60"+ light brown gravelly sandy loam or loamy sand, structureless, nonsticky, nonplastic, 20 to 50% rock fragments.

SOIL CLASSIFICATION - Andic Dystrachrepts, loamy-skeletal, mixed, frigid and Typic Vitrandepts, medial/loamy, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - The surface ash layer varies in depth and degree of mixing with subsoils. Soils with finer textured subsoils (alfisols) occur as inclusions in moist draws. Soils with gussic parent materials can occur. Approximately 50% of these soils are skeletal, and 50% are nonskeletal.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is western red cedar/pachistima (THPL/PAMY).

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a high sediment delivery efficiency rating. Other ratings are low to moderate.

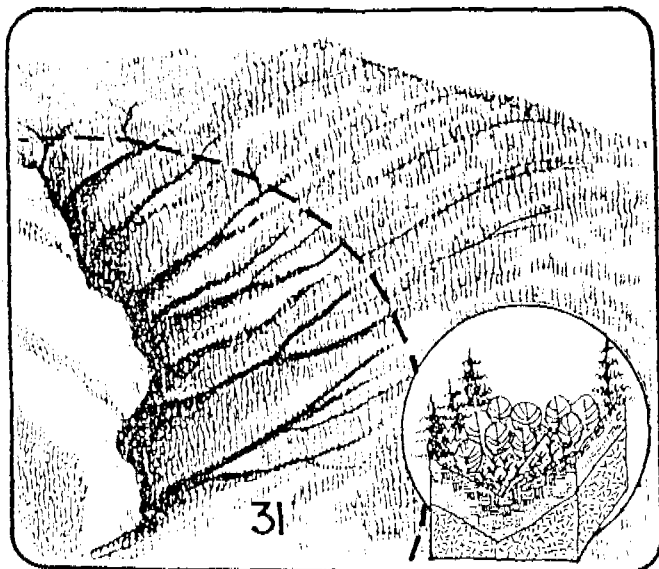
ENGINEERING - Potential road construction problems include a high sediment delivery efficiency, moderate mass wasting, and road prism erosion hazards as a source of sediment. Cutbank raveling is the major maintenance problem.

SILVICULTURE - This landtype has a regeneration limitation related to high insolation rates which can be lethal to unshaded seedlings

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate in potential for summer habitat. Winter range potential is rated moderate at low elevations where snow accumulation does not limit access.



LANDTYPE 31-G45



SUMMARY

Number of map delineations - 95
Total acreage - 5,000
Average map unit acreage - 53

These units are located on low elevation mountain slopelands. Soils are well drained on ridges, poorly drained in draws and have deep profiles developed in micaceous schist parent material. The habitat type is western red cedar or subalpine fir/pachistima with riparian vegetation in wet draws.

LANDFORM 31 MOUNTAIN SLOPELANDS

Overall relief consists of lower and midslopes of mountains and primary ridges along major drainages. Slope shapes range from straight to slightly convex-concave. Slopes are generally dissected with V-shaped draws. The drainage system has a trellis pattern.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 4,000 to 4,800 feet
- B. Slope Gradient - 30 to 60% with averages near 50%
- C. Slope Shape - Straight to slightly concave or convex
- D. Overall Relief - 500 to 1,000 feet
- E. Dissection Spacing - 500 to 1,500 feet
- F. Dissection Relief - 100 to 300 feet
- G. Dissection Density - 10 to 25 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Straight to occasionally branched dendritic with seeps and springs common forming stream heads.

STREAM DENSITY: 1-5 miles/mile²
MEAN: 3.75 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (81%)

CHANNEL TYPE: Entrenched V-channels with moderate to high energy; angular gravel-cobble substrate, good stability.

SLOPE WATER MOVEMENT: Water movement in draws and swales is subsurface with frequent springs, seeps, and bogs. Interfluvies are fairly well drained with overland flow unlikely.

SEDIMENT DELIVERY: Moderate on slopes, moderate to high in streams. Storage is moderate.

OTHER IMPORTANT CHARACTERISTICS: Stream channels are sensitive to debris damming and sediment loading and are subject to torrents. Snow and vegetative management can significantly alter water yields.

PARENT MATERIAL GROUP

This group includes well weathered granitics and associated gneisses of the Idaho Batholith.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,800 feet on all aspect slopes. Soil profiles are 60+ inches deep. Well drained ridge soils have a volcanic ash surface 7 to 20 inches thick. Poorly drained draw soils have a darkened, modified ash surface 10 to 20 inches thick. Subsurface soil is medium to coarse textured with 20 to 45% rock fragments. Naturally dense fragipan layers may occur in draws resulting in perched water.

TYPICAL SOIL PROFILES

(Well drained soil)

Surface Soil - 0 to 14" dark brown silt loam, weak granular structure, nonsticky, nonplastic, (range 7 to 20" thick).

Subsoil - 14 to 30" brown gravelly sandy loam, weak subangular blocky structure, nonsticky, nonplastic, 20 to 40% rock fragments, (range 6 to 22" thick).

Substratum - 30 to 60"+ pale brown sandy loam, structureless, nonsticky, nonplastic, 20 to 45% rock fragments.

(Poorly drained soil)

Surface Soil - 0 to 14" very dark brown silt loam with weak subangular blocky structure, nonsticky, nonplastic, (range 10 to 20" thick).

Subsoil - 8 to 22" dark greyish brown gravelly silt loam with weak subangular blocky structure, nonsticky, nonplastic, 20 to 40% rock fragments, (range 10 to 30" thick).*

Substratum - 22 to 60"+ pale brown gravelly sandy loam, structureless, nonsticky, nonplastic, 20 to 45% rock fragments.*

*NOTE: These horizons may have a naturally dense (fragipan) characteristic which can cause perching of water, resulting in poor drainage.

SOIL CLASSIFICATION - Typic Vitrandepts, medial/loamy, mixed, frigid; Andic Dystrochrepts, Toamy-skeletal, mixed, frigid; and Typic Haplumbrepts, loamy-skeletal, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Soils with gussic (sandy) parent material may occur as inclusions. Ash caps may be mixed on steeper slopes. The soils in this unit are approximately 50% skeletal, and 50% nonskeletal.

VEGETATIVE CHARACTERISTICS - The dominant habitat type on well drained sites is western red cedar/pachistima. Poorly drained draws have alder, fern, and sedge surrounded by cedar and grand fir.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a high mass wasting potential and high sediment delivery efficiency. Other ratings are low to moderate.

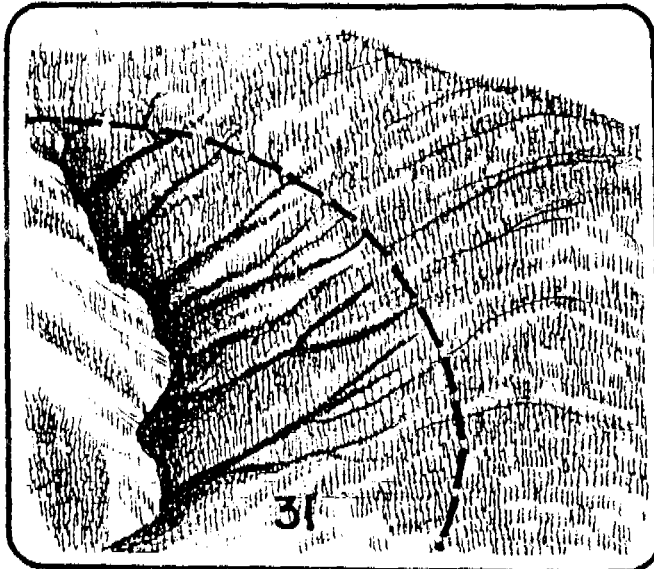
ENGINEERING - Potential road construction problems are associated with wet draws and include a high risk of mass wasting along with a high sediment delivery efficiency to streams. Cutbank sloughing and rapid brush encroachment are common maintenance problems.

SILVICULTURE - Regeneration limitations for this landtype are related to severe brush competition, high water tables and dark colored umbric soils, all of which are dominant in wet draw areas. Soil compaction potential is also rated high in wet parts of this unit. Ridges and other well drained portions of this landtype have few silvicultural limitations.

POTENTIAL WILDLIFE HABITAT - This landtype is rated high in potential for summer habitat because of abundant food, water, cover, and diversity. Winter habitat is rated low because this unit does not occur at lower elevations which are accessible to wildlife in winter.



LANDTYPE 31-K10



SUMMARY

Number of map delineations - 100
Total acreage - 12,900
Average map unit acreage - 129

These units are located on low elevation, cool aspect mountain slopes. Soils are deep, well drained, and are developed in gussic granitic parent material. The habitat type is western red cedar/pachistima.

LANDFORM 31 MOUNTAIN SLOPELANDS

Overall relief consists of lower and midslopes of mountains and primary ridges along major drainages. Slope shapes range from straight to slightly convex-concave. Slopes are generally dissected with V-shaped draws. The drainage system has a trellis pattern.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 2,200 to 4,800 feet
- B. Slope Gradient - 30 to 60% with averages near 50%
- C. Slope Shape - Straight to slightly concave or convex
- D. Overall Relief - 500 to 1,000 feet
- E. Dissection Spacing - 500 to 1,500 feet
- F. Dissection Relief - 100 to 300 feet
- G. Dissection Density - 10 to 25 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Straight to occasionally branched dendritic with seeps and springs common forming stream heads.

STREAM DENSITY: 1-5 miles/mile²
MEAN: 3.75 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (81%)

CHANNEL TYPE: Entrenched V-channels with moderate to high energy; angular gravel-cobble substrate, good stability.

SLOPE WATER MOVEMENT: Water movement is both subsurface and surface stream flow with weak regulation; movement is rapid. Subsurface water concentrations are common on lower third of slopes.

SEDIMENT DELIVERY: Moderate on slopes, moderate to high in streams. Storage is moderate.

OTHER IMPORTANT CHARACTERISTICS: Stream channels are sensitive to debris damming and sediment loading and are subject to torrents. Snow and vegetative management can significantly alter water yields.

PARENT MATERIAL GROUP

This group includes deeply weathered gussic granitics of the Idaho Batholith. Ash material lies directly over decomposed granitic material with very little soil development and is relatively impermeable.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,800 feet on low energy slopes. Soil profiles are 60+ inches deep. Surface soil is volcanic ash 8 to 22 inches thick. Subsurface soil is coarse textured with 20 to 50% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 14" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 8 to 22" thick).

Subsoil - 14 to 25" brown gravelly sandy loam - loamy sand with weak subangular blocky structure, nonsticky, nonplastic, 20 to 50% pea sized gravel, (5 to 14" thick).

Substratum - 25 to 60"+ pale brown gravelly loamy sand, structureless, nonsticky, nonplastic, 20 to 50% rock fragments.

SOIL CLASSIFICATION - Typic Vitrandepts, medial/sandy, mixed, frigid, and Andic Dystrochrepts, sandy-skeletal, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Major soil variations are the ash cap depth and degree of ash cap subsoil mixing. Subsoils thicker than 14 inches and with sandy loam textures occur as inclusions in moist draw areas. This unit contains approximately 65% skeletal soils and 40% nonskeletal soils.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is western red cedar/pachistima (THPL/PAMY).

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect and parent material erosion potential and a high sediment delivery efficiency. Other ratings are low to moderate. Because of these highly erosive subsurface soils, skidding, site preparation, and slash disposal operations should avoid removal or displacement of the volcanic ash topsoil.

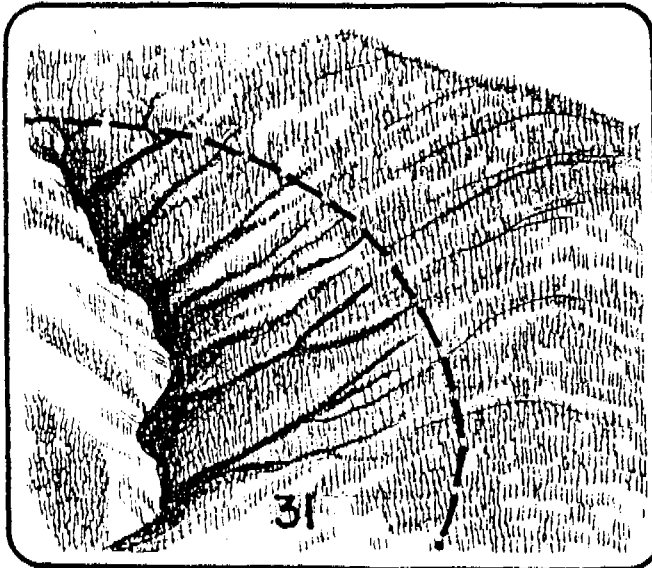
ENGINEERING - Potential road construction problems include very high erosion rates in the excavated road prism with a high risk of sediment being delivered to streams. Dry cutbank raveling and road prism erosion are common maintenance problems. Revegetation of cut and fill slopes is difficult and standard methods of seeding, fertilizing, and mulching are often unsuccessful.

SILVICULTURE - The volcanic ash topsoil is critical to the productivity of this landtype and heavy equipment operations should avoid removal or displacement of this surface layer. Ash removal results in a significant reduction in moisture holding and nutrient supplying capacity. There are no major regeneration limitations for this landtype.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate in potential for summer habitat. Winter range potential is rated moderate at low elevations where snow accumulation does not limit access.



LANDTYPE 31-K20



SUMMARY

Number of map delineations - 91
Total acreage - 13,100
Average map unit acreage - 144

These units are located on low elevation, warm aspect, mountain slopelands. Soils are deep, well drained, and are developed in gussic granitic parent material. The habitat type is western red cedar/pachistima.

LANDFORM 31 MOUNTAIN SLOPELANDS

Overall relief consists of lower and midslopes of mountains and primary ridges along major drainages. Slope shapes range from straight to slightly convex-concave. Slopes are generally dissected with V-shaped draws. The drainage system has a trellis pattern.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 1,600 to 4,800 feet
- B. Slope Gradient - 30 to 60% with averages near 50%
- C. Slope Shape - Straight to slightly concave or convex
- D. Overall Relief - 500 to 1,000 feet
- E. Dissection Spacing - 500 to 1,500 feet
- F. Dissection Relief - 100 to 300 feet
- G. Dissection Density - 10 to 25 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Straight to occasionally branched dendritic with seeps and springs common forming stream heads.

STREAM DENSITY: 1-5 miles/mile²
MEAN: 3.75 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (81%)

CHANNEL TYPE: Entrenched V-channels with moderate to high energy; angular gravel-cobble substrate, good stability.

SLOPE WATER MOVEMENT: Water movement is both subsurface and surface stream flow with weak regulation; movement is rapid. Subsurface water concentrations are common on lower third of slopes.

SEDIMENT DELIVERY: Moderate on slopes, moderate to high in streams. Storage is moderate.

OTHER IMPORTANT CHARACTERISTICS: Stream channels are sensitive to debris damming and sediment loading and are subject to torrents. Snow and vegetative management can significantly alter water yields.

PARENT MATERIAL GROUP

This group includes deeply weathered gussic granitics of the Idaho Batholith. Ash material lies directly over decomposed granitic material with weak soil development and is relatively impermeable.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,800 feet on high energy slopes. Soil profiles are 60+ inches deep. Surface soil is volcanic ash 7 to 17 inches thick. Subsurface soil is coarse textured with 10 to 50% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 10" dark brown silt loam with weak granular structure, nonsticky, nonplastic, 10 to 50% rock fragments, (range 7 to 17" thick).

Subsoil - 10 to 25" brown gravelly sandy loam - loamy sand with weak subangular blocky structure, nonsticky, nonplastic, 20 to 50% rock fragments, (range 10 to 20" thick).

Substratum - 25 to 60"+ pale brown gravelly loamy sand, structureless, nonsticky, nonplastic, 20 to 50% pea size gravels.

SOIL CLASSIFICATION - Andic Dystrachrepts, sandy, mixed, frigid, and Typic Vitrandepts, medial/sandy-skeletal, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Major soil variations are the ash cap depth and degree of ash cap/subsoil mixing. Subsoils thicker than 14 inches with sandy loam textures occur as inclusions in moist draw areas. This unit contains approximately 65% nonskeletal soils, and 35% skeletal soils.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is western red cedar/pachistima (THPL/PAMY).

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect high subsoil and very high parent material erosion potentials and a high mass wasting sediment delivery efficiency. Other ratings are low to moderate. Because of these highly erosive subsurface soils, skidding, site preparation, and slash disposal operations should avoid removal or displacement of the volcanic ash topsoil. A major watershed objective should be to minimize the movement of eroded material into drainages.

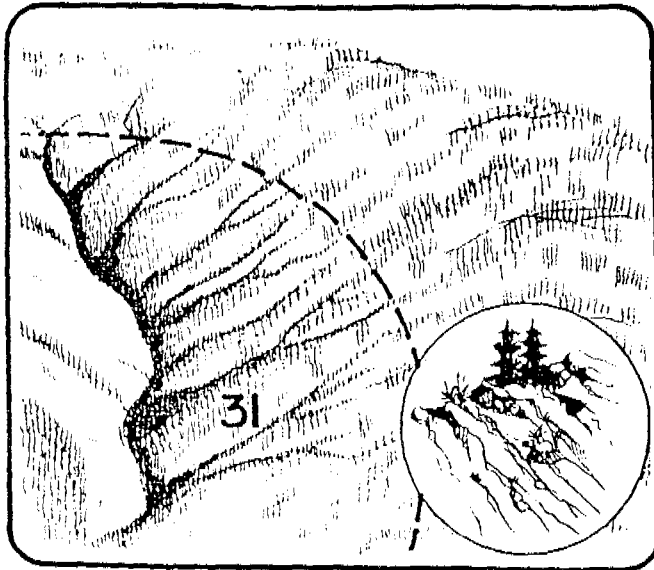
ENGINEERING - Potential road construction problems include very high erosion rates in the excavated road prism with a high risk of sediment being delivered to streams. Dry cutbank raveling and road prism erosion are common maintenance problems. Revegetation of cut and fill slopes is difficult and standard methods of seeding, fertilizing, and mulching are often unsuccessful.

SILVICULTURE - The volcanic ash topsoil is critical to the productivity of this landtype and heavy equipment operations should avoid removal or displacement of this surface layer. Ash removal results in a significant reduction in moisture holding and nutrient supplying capacity. A regeneration limitation for this landtype is the high insolation rate which can be lethal to seedlings.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate in potential for summer habitat. Winter range potential is rated moderate at low elevations where snow accumulation does not limit access.



LANDTYPE 31-K26



SUMMARY

Number of map delineations - 26
Total acreage - 1,000
Average map unit acreage - 38

These units are located on low elevation, warm aspect, mountain slopes. Soils are shallow to moderately deep, somewhat excessively drained, and are developed in grussic granitic parent material. The habitat types are grand fir/pachistima and Douglas-fir/ninebark. Shallow soil and rock outcrop occupy 10 to 30% of this unit.

LANDFORM 31 MOUNTAIN SLOPELANDS

Overall relief consists of lower and midslopes of mountains and primary ridges along major drainages. Slope shapes range from straight to slightly convex-concave. Slopes are generally dissected with V-shaped draws. The drainage system has a trellis pattern.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 2,200 to 5,000 feet
- B. Slope Gradient - 30 to 60% with averages near 50%
- C. Slope Shape - Straight to slightly concave or convex
- D. Overall Relief - 500 to 1,000 feet
- E. Dissection Spacing - 500 to 1,500 feet
- F. Dissection Relief - 100 to 300 feet
- G. Dissection Density - 10 to 25 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Straight to occasionally branched dendritic with seeps and springs common forming stream heads.

STREAM DENSITY: 1-5 miles/mile²
MEAN:

PRIMARY STREAM ORDER: 1 and 2

CHANNEL TYPE: Entrenched V-channels with moderate to high energy; angular gravel-cobble substrate, good stability.

SLOPE WATER MOVEMENT: Overland flow is common on portions with thin soils. Streamflow tends rapid and flashy.

SEDIMENT DELIVERY: Moderate on slopes, moderate to high in streams. Storage is moderate.

OTHER IMPORTANT CHARACTERISTICS: Stream channels are sensitive to debris damming and sediment loading and are subject to torrents. Snow and vegetative management can significantly alter water yields.

PARENT MATERIAL GROUP

This group includes deeply weathered grussic granitics of the Idaho Batholith. Ash material lies directly over decomposed granitic material with weak soil development and is relatively impermeable. Shallow soils and rock outcrop occupy 10 to 30% of this unit.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 5,000 feet on high energy slopes. Soil profiles are 16 to 60 inches deep and tend to be droughty. Surface soil is highly mixed volcanic ash 3 to 8 inches thick. Subsurface soil is coarse textured with 40 to 60% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 5" dark brown silt loam, weak granular structure, nonsticky, nonplastic, 15 to 20% rock fragments, (range 3 to 8" thick).

Subsoil/Substratum - 9 to 30" pale brown very gravelly loamy sand, structureless, nonsticky, nonplastic, 40 to 60% rock fragments.

SOIL CLASSIFICATION - Andic Dystrachrepts, sandy-skeletal, mixed, frigid; Dystric Xerorthents, sandy-skeletal, mixed, frigid; and rock outcrops.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Deep soils, with and without ash caps, occur in draws and along lower margins of the unit. This soils and rock outcrop occur on interflaves and points. The soils in this unit are approximately 70% skeletal, and 30% nonskeletal.

VEGETATIVE CHARACTERISTICS - The dominant habitat types are grand fir/pachistima (ABGR/PAMY) on deeper soils and Douglas-fir/ninebark on shallow sites.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a very high parent material erosion potential, high subsoil erosion potential, and high sediment delivery efficiency. Because of these highly erosive subsurface soils, skidding, site preparation, and slash disposal operations should avoid removal or displacement of the volcanic ash topsoil. A major watershed objective should be to minimize the movement of eroded material into drainages.

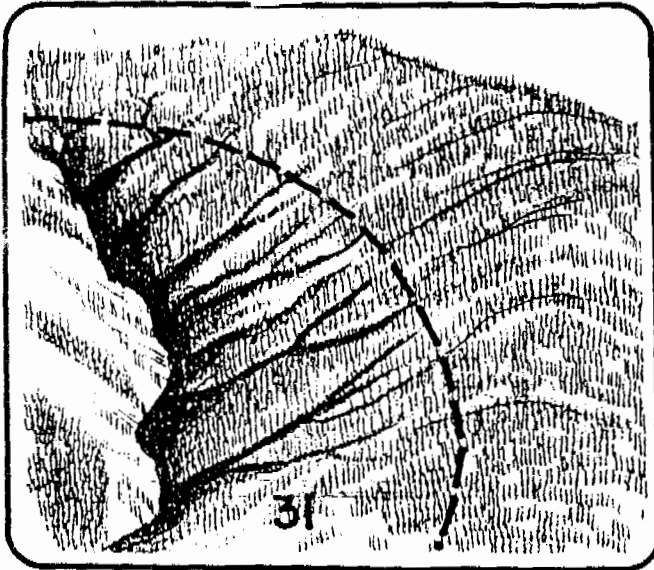
ENGINEERING - Potential road construction problems include high erosion rates in the excavated road prism with a high risk of sediment being delivered to streams. Dry cutbank raveling is a maintenance problem. Revegetation of cut and fill slopes is difficult and standard methods of seeding, fertilizing, and mulching are often unsuccessful.

SILVICULTURE - The volcanic ash topsoil is critical to the productivity of this landtype and heavy equipment operations should avoid removal or displacement of this surface layer. Ash removal results in a significant reduction in moisture holding and nutrient supplying capacity. Regeneration limitations for this landtype include thin droughty soils with rock outcrops, shallow (less than 7") ash surface horizons, and high insolation rates which can be lethal to seedlings. Prescribed fire on this landtype should be used with care so as to prevent excessive soil temperatures which could result in surface soil erosion.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate in potential for summer habitat. Winter range potential is rated moderate at low elevations where snow accumulation does not limit access.



LANDTYPE 31-Q10



SUMMARY

Number of map delineations - 324
Total acreage - 63,800
Average map unit acreage - 197

These units are located on low elevation, cool aspect, mountain slopelands. Soils are deep, well drained, and are developed in quartzite parent material. The habitat type is western red cedar/pachistima.

LANDFORM 31 MOUNTAIN SLOPELANDS

Overall relief consists of lower and midslopes of mountains and primary ridges along major drainages. Slope shapes range from straight to slightly convex-concave. Slopes are generally dissected with V-shaped draws. The drainage system has a trellis pattern.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 2,800 to 4,800 feet
- B. Slope Gradient - 30 to 60% with averages near 50%
- C. Slope Shape - Straight to slightly concave or convex
- D. Overall Relief - 500 to 1,000 feet
- E. Dissection Spacing - 500 to 1,500 feet
- F. Dissection Relief - 100 to 300 feet
- G. Dissection Density - 10 to 25 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Straight to occasionally branched dendritic with seeps and springs common forming stream heads.

STREAM DENSITY: 1-5 miles/mile²
MEAN: 3.75 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (81%)

CHANNEL TYPE: Entrenched V-channels with moderate to high energy; angular gravel-cobble substrate, good stability.

SLOPE WATER MOVEMENT: Water movement is both subsurface and surface stream flow with weak regulation; movement is rapid. Subsurface water concentrations are common on lower third of slopes.

SEDIMENT DELIVERY: Moderate on slopes, moderate to high in streams. Storage is moderate.

OTHER IMPORTANT CHARACTERISTICS: Stream channels are sensitive to debris damming and sediment loading and are subject to torrents. Snow and vegetative management can significantly alter water yields.

PARENT MATERIAL GROUP

This group includes quartzites, argillites and siltites of the Belt Supergroup exclusive of Revett formation. These are generally weakly weathered.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,800 feet on low energy slopes. Soil profiles are 60+ inches deep. Surface soil is volcanic ash 9 to 22 inches thick. Subsurface soil is coarse textured with 20 to 50% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 15" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 9 to 22" thick).

Subsoil - 15 to 31" brown gravelly fine sandy loam to silt loam with weak subangular blocky structure, nonsticky, nonplastic, 20 to 50% rock fragments, (range 10 to 36" thick).

Substratum - 31 to 60"+ pale brown gravelly sandy loam, structureless, nonsticky, nonplastic, 20 to 50% rock fragments.

SOIL CLASSIFICATION - Typic Vitrandepts, medial/loamy-skeletal, mixed, frigid, and Andic Dystrochrepts, loamy-skeletal, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Coarse fragment content is variable. Sandy loam subsoil textures are associated with quartzite while silt loam textures are associated argillites and siltites. These units consist of approximately 60% skeletal soils, and 40% nonskeletal soils.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is western red cedar/pachistima (THPL/PAMY).

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a high sediment delivery efficiency rating. Other hazard ratings are low to moderate.

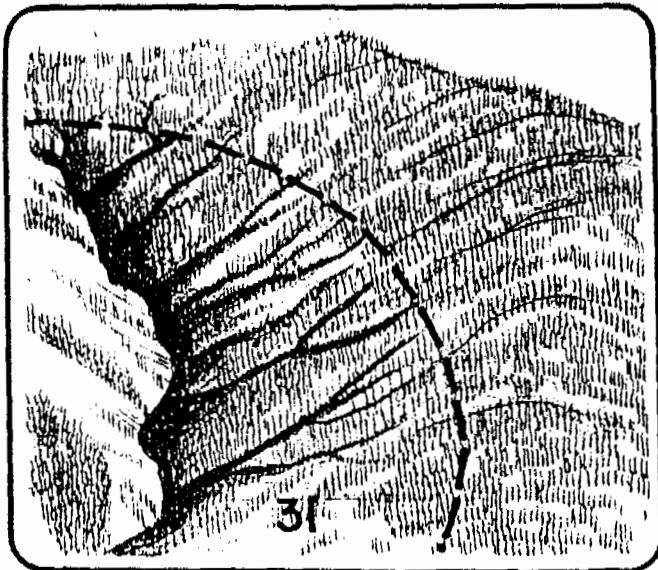
ENGINEERING - Potential road construction problems include a high sediment delivery efficiency with mass wasting being a moderate hazard as a source of sediment.

SILVICULTURE - This landtype has no major silvicultural regeneration limitations.

POTENTIAL WILDLIFE HABITAT This landtype is rated moderate in potential for summer habitat. Winter range potential is rated moderate at low elevations where snow accumulation does not limit access.



LANDTYPE 31-Q20



SUMMARY

Number of map delineations - 263
Total acreage - 40,700
Average map unit acreage - 155

These units are located on low elevation, warm aspect, mountain slopelands. Soils are deep, well drained, and are developed in quartzite parent material. The habitat type is western red cedar/pachistima.

LANDFORM 31 MOUNTAIN SLOPELANDS

Overall relief consists of lower and midslopes of mountains and primary ridges along major drainages. Slope shapes range from straight to slightly convex-concave. Slopes are generally dissected with V-shaped draws. The drainage system has a trellis pattern.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 2,800 to 4,800 feet
- B. Slope Gradient - 30 to 60% with averages near 50%
- C. Slope Shape - Straight to slightly concave or convex
- D. Overall Relief - 500 to 1,000 feet
- E. Dissection Spacing - 500 to 1,500 feet
- F. Dissection Relief - 100 to 300 feet
- G. Dissection Density - 10 to 25 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Straight to occasionally branched dendritic with seeps and springs common forming stream heads.

STREAM DENSITY: 1-5 miles/mile²
MEAN: 3.75 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (81%)

CHANNEL TYPE: Entrenched V-channels with moderate to high energy; angular gravel-cobble substrate, good stability.

SLOPE WATER MOVEMENT: Water movement is both subsurface and surface stream flow with weak regulation; movement is rapid. Subsurface water concentrations are common on lower third of slopes.

SEDIMENT DELIVERY: Moderate on slopes, moderate to high in streams. Storage is moderate.

OTHER IMPORTANT CHARACTERISTICS: Stream channels are sensitive to debris damming and sediment loading and are subject to torrents. Snow and vegetative management can significantly alter water yields.

PARENT MATERIAL GROUP

This group includes quartzites, argillites, and siltites of the Belt Supergroup, exclusive of Revett Formation. These are generally weakly weathered.

SOIL-VEGETATIVE UNIT

This unit occurs at lower elevations of less than 4,800 feet on warm aspects. These well drained soils have a volcanic ash surface 9 to 16 inches thick. Subsurface soils have sandy loam to silt loam textures with 20 to 60% rock fragments. Soil depth is 60 inches plus.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 12" dark brown silt loam with weak, granular structure, nonsticky, nonplastic, (range 9 to 16" thick).

Subsoil - 0 to 12" dark brown silt loam with weak granular blocky structure, nonsticky, nonplastic, 20 to 60% rock fragments, (range 13 to 56" thick).

Substratum - 32 to 60"+ pale brown gravelly sandy loam, structureless, nonsticky, nonplastic, 20 to 60% rock fragments.

SOIL CLASSIFICATION - Andic Dystrachrepts, loamy-skeletal, mixed, frigid, and Typic Vitrandepts, medial/loamy, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Ash surface layers vary in depth and degree of mixing. Coarse fragment is variable. Sandy loam subsoils are weathered from quartzite with silt loam subsoils weathered from siltites and argillites. These units consist of approximately 60% skeletal soils, and 40% nonskeletal soils.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is western red cedar/pachistima (THPL/PAMY) with grand fir/pachistima (ABGR/PAMY) on somewhat drier sites.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a high sediment delivery efficiency rating. Other hazard ratings are low to moderate.

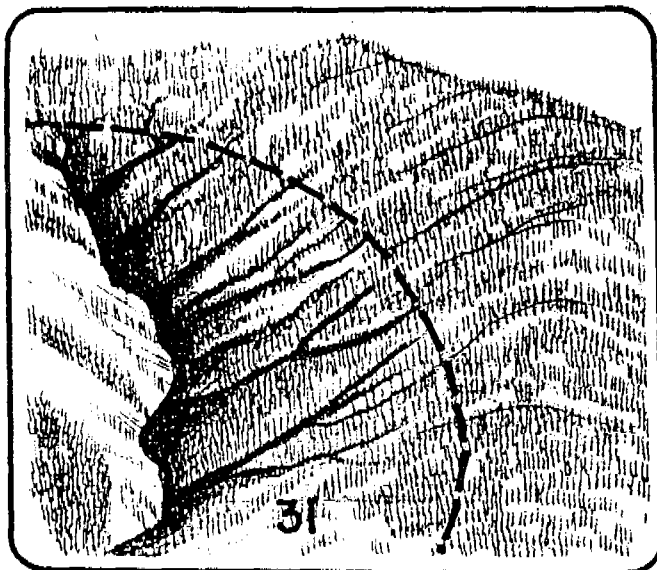
ENGINEERING - Potential road construction problems include a high sediment delivery efficiency with mass wasting being a moderate hazard as a source of sediment.

SILVICULTURE - This landtype has a regeneration limitation related to high insolation rates which can be lethal to seedlings.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate in potential for summer habitat. Winter range potential is rated moderate at low elevations where snow accumulation does not limit access.



LANDTYPE 31-Q25



SUMMARY

Number of map delineations - 44
Total acreage - 7,200
Average map unit acreage - 164

These units are located on low elevation warm aspect, mountain slopelands in the western portion of the Forest (Palouse District). Soils are deep, well to excessively drained and developed in quartzite parent material. The habitat type is grand fir/pachistima.

LANDFORM 31 MOUNTAIN SLOPELANDS

Overall relief consists of lower and midslopes of mountains and primary ridges along major drainages. Slope shapes range from straight to slightly convex-concave. Slopes are generally dissected with V-shaped draws. The drainage system has a trellis pattern.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 2,000 to 4,800 feet
- B. Slope Gradient - 30 to 60% with averages near 50%
- C. Slope Shape - Straight to slightly concave or convex
- D. Overall Relief - 500 to 1,000 feet
- E. Dissection Spacing - 500 to 1,500 feet
- F. Dissection Relief - 100 to 300 feet
- G. Dissection Density - 3 to 8 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Straight to occasionally branched dendritic with seeps and springs common forming stream heads.

STREAM DENSITY: 1-5 miles/mile²
MEAN: 3.75 miles/mi²

PRIMARY STREAM ORDER: 1 and 2 (81%)

CHANNEL TYPE: Entrenched V-channels with moderate to high energy; angular gravel-cobble substrate, good stability.

SLOPE WATER MOVEMENT: Water movement is both subsurface and surface stream flow with weak regulation; movement is rapid. Subsurface water concentrations are common on lower third of slopes.

SEDIMENT DELIVERY: Moderate on slopes, moderate to high in streams. Storage is moderate.

OTHER IMPORTANT CHARACTERISTICS: Stream channels are sensitive to debris damming and sediment loading and are subject to torrents. Snow and vegetative management can significantly alter water yields.

PARENT MATERIAL GROUP

This group includes Libby siltites, Striped Peak quartzite, Revett quartzite and quartz-rich wallace gneiss, all in the Belt Supergroup of metasediments. All are moderately weathered. Most of the units also have a thin surface layer of Mazama volcanic ash on the surface.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,800 feet on high energy slopes. Soil profiles are generally 60+ inches deep. The surface soil is volcanic ash 10 to 18 inches thick. Subsurface soil is medium textured with 10 to 40% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 15" dark greyish brown loam with moderate granular structure, friable, slightly sticky, slightly plastic, (range 10 to 18" thick).

Subsoil - 15 to 40" brown gravelly loam, with moderate subangular blocky structure, friable, nonsticky, nonplastic, 10 to 40% rock fragments, (range 10 to 40" thick).

Substratum - 40 to 60" yellowish brown very gravelly loam, structureless, friable, nonsticky, nonplastic, 10 to 40% rock fragments.

SOIL CLASSIFICATION - Dystric and Andic Xerochrepts, coarse-loamy, and loamy-skeletal, mixed, frigid, families.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - This soil type dominates this landtype but with up to 30% inclusions. Soils similar to the one above are those with more than 7 inches volcanic ash, some with more than 35% rock fragments, and some with some clay accumulation in the subsoil. Contrasting inclusions are soils which are shallow (less than 20" deep), those with horizons of clay accumulation, wet soils along drainages, and more moist soils on north to east microsites with more volcanic ash supporting western red cedar.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is grand fir/pachistima, near the moist end of the range. Some units have inclusions of western red cedar/pachistima.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect low to moderate potential hazard ratings.

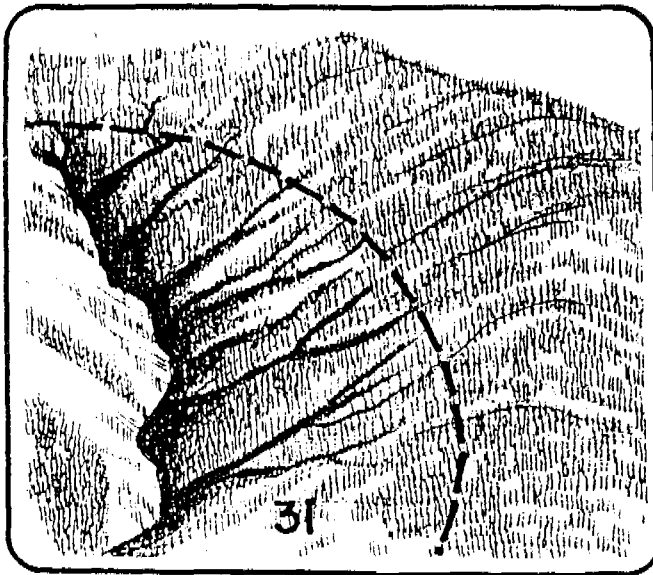
ENGINEERING - Potential road construction problems include a high sediment delivery efficiency with mass wasting being a moderate hazard as a source of sediment.

SILVICULTURE - Major regeneration limitations include droughty soils, mixed ash topsoil and high insolation rates.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate in potential for summer habitat. Winter range potential is rated moderate at lower elevations where snow accumulation does not limit access.



LANDTYPE 31-R10



SUMMARY

Number of map delineations - 21
Total acreage - 2,300
Average map unit acreage - 110

These units are located on low elevation, cool aspect, mountain slopelands. Soils are deep, well drained, and are developed in Revett quartzite parent material. The habitat type is western red cedar/pachistima.

LANDFORM 31 MOUNTAIN SLOPELANDS

Overall relief consists of lower and midslopes of mountains and primary ridges along major drainages. Slope shapes range from straight to slightly convex-concave. Slopes are generally dissected with V-shaped draws. The drainage system has a trellis pattern.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 2,500 to 4,800 feet
- B. Slope Gradient - 30 to 60% with averages near 50%
- C. Slope Shape - Straight to slightly concave or convex
- D. Overall Relief - 500 to 1,000 feet
- E. Dissection Spacing - 500 to 1,500 feet
- F. Dissection Relief - 100 to 300 feet
- G. Dissection Density - 10 to 25 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Straight to occasionally branched dendritic with seeps and springs common forming stream heads.

STREAM DENSITY: 1-5 miles/mile²
MEAN: 3.75 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (81%)

CHANNEL TYPE: Entrenched V-channels with moderate to high energy; angular gravel-cobble substrate, good stability.

SLOPE WATER MOVEMENT: Water movement is both subsurface and surface stream flow with weak regulation; movement is rapid. Subsurface water concentrations are common on lower third of slopes.

SEDIMENT DELIVERY: Moderate on slopes, moderate to high in streams. Storage is moderate.

OTHER IMPORTANT CHARACTERISTICS: Stream channels are sensitive to debris damming and sediment loading and are subject to torrents. Snow and vegetative management can significantly alter water yields.

PARENT MATERIAL GROUP

This group includes Revett quartzite. This bedrock is located in the Osier Basin on Kelly Creek District. This is well weathered quartzite which decomposes rapidly to sand when the rock is exposed to the elements.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,800 feet on low energy slopes. Soil profiles are 60+ inches deep. Surface soil is volcanic ash 7 to 18 inches thick. Subsurface soil is coarse textured with 5 to 40% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 14" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 7 to 18" thick).

Subsoil - 14 to 32" brown very fine sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 5 to 25% rock fragments, (range 6 to 35" thick).

Substratum - 32 to 60"+ pale brown gravelly very fine loamy sand, structureless, nonsticky, nonplastic, 10 to 40% rock fragments.

SOIL CLASSIFICATION - Typic Vitrandepts, medial/loamy, mixed, frigid, and Andic Dystrochrepts, coarse-loamy, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - This mapping unit is limited to the Deception area of the Kelly Creek District. Major variation is rock fragment content and degree of substratum weathering.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is western red cedar/pachistima (THPL/PAMY).

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect high parent material and subsoil erosion potentials with a high sediment delivery efficiency. Because of these highly erosive subsurface soils, skidding, site preparation, and slash disposal operations should avoid removal or displacement of the volcanic ash topsoil. A major watershed objective should be to minimize the movement of eroded material into drainages. This may require the placing of drainage ditch outlets on convex slopes and the use of sediment traps.

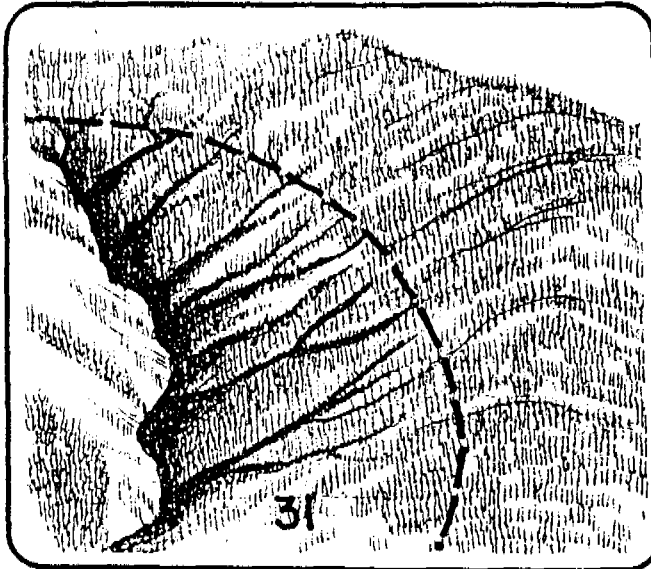
ENGINEERING - Potential road construction problems include a very high erosion rate from the excavated road prism. Sediment delivery efficiency into streams is high. Cutbank and fill sloughing are maintenance problems. The trafficability for road surfaces in this landtype is poor. Cut and fill slopes are susceptible to the piping of water.

SILVICULTURE - The volcanic ash topsoil is important to the productivity of this landtype, and heavy equipment operations should avoid removal or displacement of this surface layer. Ash removal results in a reduction in moisture holding and nutrient supplying capacity. With the ash topsoil intact, this landtype has few silvicultural limitations.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate in potential for summer habitat. Winter range potential is rated moderate at low elevations where snow accumulation does not limit access.



LANDTYPE 31-R20



SUMMARY

Number of map delineations - 28
Total acreage - 1,900
Average map unit acreage - 68

These units are located on low elevation, warm aspect, mountain slopelands. Soils are deep, well drained, and are developed in Revett quartzite parent material. The habitat type is western red cedar/pachistima.

LANDFORM 31 MOUNTAIN SLOPELANDS

Overall relief consists of lower and midslopes of mountains and primary ridges along major drainages. Slope shapes range from straight to slightly convex-concave. Slopes are generally dissected with V-shaped draws. The drainage system has a trellis pattern.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 2,500 to 4,800 feet
- B. Slope Gradient - 30 to 60% with averages near 50%
- C. Slope Shape - Straight to slightly concave or convex
- D. Overall Relief - 500 to 1,000 feet
- E. Dissection Spacing - 500 to 1,500 feet
- F. Dissection Relief - 100 to 300 feet
- G. Dissection Density - 10 to 25 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Straight to occasionally branched dendritic with seeps and springs common forming stream heads.

STREAM DENSITY: 1-5 miles/mile²
MEAN: 3.75 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (81%)

CHANNEL TYPE: Entrenched V-channels with moderate to high energy; angular gravel-cobble substrate, good stability.

SLOPE WATER MOVEMENT: Water movement is both subsurface and surface stream flow with weak regulation; movement is rapid. Subsurface water concentrations are common on lower third of slopes.

SEDIMENT DELIVERY: Moderate on slopes, moderate to high in streams. Storage is moderate.

OTHER IMPORTANT CHARACTERISTICS: Stream channels are sensitive to debris damming and sediment loading and are subject to torrents. Snow and vegetative management can significantly alter water yields.

PARENT MATERIAL GROUP

This group includes Revett quartzite. This bedrock is located in the Osier Basin on Kelly Creek District. This is well weathered quartzite which decomposes rapidly to sand when the rock is exposed to the elements.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,800 feet on high energy slopes. Soil profiles are 60+ inches deep. Surface soil is volcanic ash 6 to 16 inches thick. Subsurface soil is coarse textured with 5 to 30% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 12" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 6 to 16" thick).

Subsoil - 12 to 27" brown fine sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 5 to 20% rock fragments, (range 8 to 24" thick).

Substratum - 27 to 60"+ pale brown gravelly loamy fine sand, structureless, nonsticky, nonplastic, 15 to 30% rock fragments.

SOIL CLASSIFICATION - Andic Dystrachrepts, coarse-loamy, mixed, frigid, and Typic Vitrandepts, medial/loamy, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - This mapping unit is limited to the Deception area of the Kelly Creek District. The unit occurs on southerly aspects with thin droughty soil as a common inclusion on ridge points and severe exposures. Amount of rock fragment and degree of parent material weathering is variable.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is western red cedar/pachistima (THPL/PAMY) with grand fir/pachistima (ABGR/PAMY) on drier sites.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect high parent material and subsoil erosion potentials with a high sediment delivery efficiency. Because of these highly erosive subsurface soils, skidding, site preparation, and slash disposal operations should avoid removal or displacement of the volcanic ash topsoil. A major watershed objective should be to minimize the movement of eroded material into drainages. This may require the placing of drainage ditch outlets on convex slopes and the use of sediment traps.

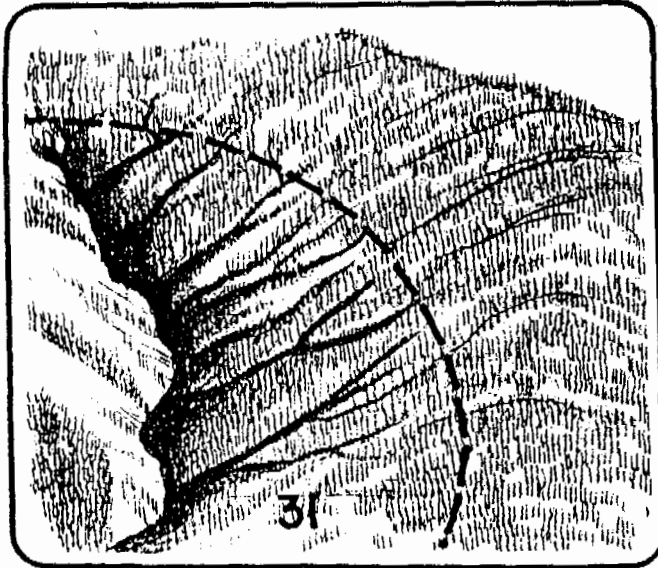
ENGINEERING - Potential road construction problems include a very high erosion rate from the excavated road prism. Sediment delivery efficiency into streams is high. Cutbank and fill sloughing are maintenance problems. The trafficability rating for road surfaces is poor. Cut and fill slopes are susceptible to the piping of water.

SILVICULTURE - The volcanic ash topsoil is important to the productivity of this landtype and heavy equipment operations should avoid removal or displacement of this surface layer. Ash removal results in a loss of moisture holding and nutrient supplying capacity. The major regeneration limitation is the high insolation rate which can be lethal to seedlings.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate in potential for summer habitat. Winter range potential is rated moderate at low elevations where snow accumulation does not limit access.



LANDTYPE 31-S10



SUMMARY

Number of map delineations - 325
Total acreage - 40,200
Average map unit acreage - 124

These units are located on low elevation, cool aspect, mountain slopelands. Soils are deep, well drained, and developed in micaceous schist parent material. The habitat type is western red cedar/pachistima.

LANDFORM 31 MOUNTAIN SLOPELANDS

Overall relief consists of lower and midslopes of mountains and primary ridges along major drainages. Slope shapes range from straight to slightly convex-concave. Slopes are generally dissected with V-shaped draws. The drainage system has a trellis pattern.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 1,600 to 4,800 feet
- B. Slope Gradient - 30 to 60% with averages near 50%
- C. Slope Shape - Straight to slightly concave or convex
- D. Overall Relief - 500 to 1,000 feet
- E. Dissection Spacing - 500 to 1,500 feet
- F. Dissection Relief - 100 to 300 feet
- G. Dissection Density - 10 to 25 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Straight to occasionally branched dendritic with seeps and springs common forming stream heads.

STREAM DENSITY: 1-5 miles/mile²
MEAN: 3.75 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (81%)

CHANNEL TYPE: Entrenched V-channels with moderate to high energy; angular gravel-cobble substrate, good stability.

SLOPE WATER MOVEMENT: Water movement is both subsurface and surface stream flow with weak regulation; movement is rapid. Subsurface water concentrations are common on lower third of slopes.

SEDIMENT DELIVERY: Moderate on slopes, moderate to high in streams. Storage is moderate.

OTHER IMPORTANT CHARACTERISTICS: Stream channels are sensitive to debris damming and sediment loading and are subject to torrents. Snow and vegetative management can significantly alter water yields.

PARENT MATERIAL GROUP

This group includes moderately weathered, micaceous schists, gneisses, and interbedded pegmatites of the Belt Supergroup commonly referred to as the Border Zone.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,800 feet on low energy slopes. Soil profiles are 60+ inches deep. Surface soil is volcanic ash 7 to 23 inches thick. Subsurface soil is coarse textured with 20 to 60% rock fragments and an estimated 10 to 20% mica content.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 14" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 7 to 23" thick).

Subsoil - 14 to 32" brown gravelly sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 20 to 50% rock fragments, (range 10 to 25" thick).

Substratum - 32 to 60"+ pale brown gravelly sandy loam, structureless, nonsticky, nonplastic, 20 to 60% rock fragments.

SOIL CLASSIFICATION - Typic Vitrandepts, medial/loamy, mixed, frigid, and Andic Dystrochrepts, Toamy-skeletal, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Ash cap mixing is common on steeper slopes. Thinner soils are associated with rock outcrops. Soils with finer textured subsoils (alfisols) commonly occur in moist draws and are weathered from mica schist. Soils weathered from gneiss are sandy loam textured. This unit consists of approximately 50% skeletal soils and 50% nonskeletal soils. Clay loam textured subsoils occur in the Smith Creek area of the Lochsa District.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is western red cedar/pachistima (THPL/PAMY).

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations indicate a high mass wasting potential and a high sediment delivery efficiency rating. Other ratings are low to moderate.

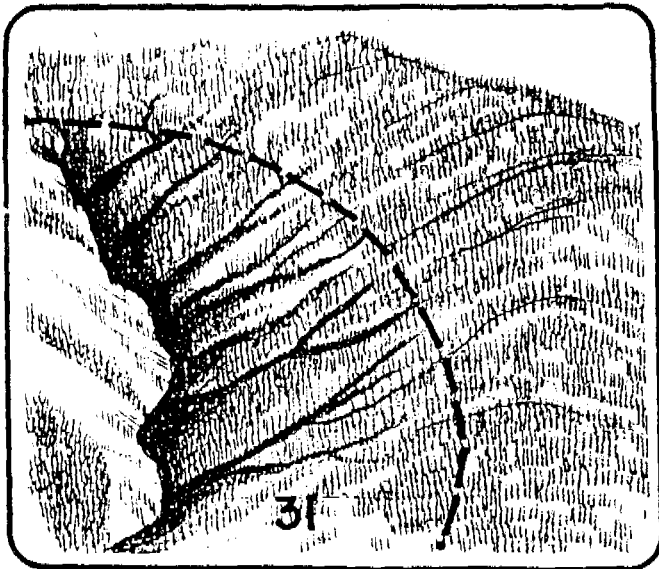
ENGINEERING - Potential road construction problems include a high mass wasting hazard and a high risk of sediment being delivered to streams. Cutbank and fill sloughing commonly require maintenance. Finer textured soils, which occur in draws, have low bearing strengths and are subject to rutting if exposed to heavy traffic when wet.

SILVICULTURE - There are no major regeneration limitations for this landtype. These are highly productive landtypes.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate in potential for summer habitat. Winter range potential is rated moderate at low elevations where snow accumulation does not limit access.



LANDTYPE 31-S20



SUMMARY

Number of map delineations - 290
Total acreage - 33,400
Average map unit acreage - 115

These units are located on low elevation, warm aspect mountain slopelands. Soils are deep, well drained, and are developed in micaceous schist parent material. The habitat type is western red cedar/pachistima.

LANDFORM 31 MOUNTAIN SLOPELANDS

Overall relief consists of lower and midslopes of mountains and primary ridges along major drainages. Slope shapes range from straight to slightly convex-concave. Slopes are generally dissected with V-shaped draws. The drainage system has a trellis pattern.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 1,600 to 4,800 feet
- B. Slope Gradient - 30 to 60% with averages near 50%
- C. Slope Shape - Straight to slightly concave or convex
- D. Overall Relief - 500 to 1,000 feet
- E. Dissection Spacing - 500 to 1,500 feet
- F. Dissection Relief - 100 to 300 feet
- G. Dissection Density - 10 to 25 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Straight to occasionally branched dendritic with seeps and springs common forming stream heads.

STREAM DENSITY: 1-5 miles/mile²
MEAN: 3.75 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (81%)

CHANNEL TYPE: Entrenched V-channels with moderate to high energy; angular gravel-cobble substrate, good stability.

SLOPE WATER MOVEMENT: Water movement is both subsurface and surface stream flow with weak regulation; movement is rapid. Subsurface water concentrations are common on lower third of slopes.

SEDIMENT DELIVERY: Moderate on slopes, moderate to high in streams. Storage is moderate.

OTHER IMPORTANT CHARACTERISTICS: Stream channels are sensitive to debris damming and sediment loading and are subject to torrents. Snow and vegetative management can significantly alter water yields.

PARENT MATERIAL GROUP

This group includes moderately weathered, micaceous schists, gneisses, and interbedded pegmatites of the Belt Supergroup commonly referred as high grade metamorphics of the Border Zone.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,800 feet on high energy slopes. Soil profiles are 60+ inches deep. Surface soil is volcanic ash 7 to 18 inches thick. Subsurface soil is coarse textured with 10 to 60% rock fragments and an estimated 10 to 20% mica content.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 12" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 7 to 18" thick).

Subsoil - 12 to 25" brown gravelly sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 10 to 50% rock fragments, (range 10 to 22" thick).

Substratum - 25 to 50"+ pale brown sandy loam, structureless, nonsticky, nonplastic, 10 to 60% rock fragments.

SOIL CLASSIFICATION - Andic Dystrachrepts, loamy-skeletal, mixed, frigid, and Typic Vitrandepts, medial/loamy, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Heavier textured subsoils occur in moist draws and depressions. These finer textured soils have loam to clay loam subsoils. Thin (lithic-20" deep) soils occur adjacent to bedrock outcrops. Clay loam textured subsoils occur in the Smith Creek area on the Lochsa Ranger District.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is western red cedar/pachistima (THPL/PAMY). Somewhat drier sites have grand fir/pachistima (ABGR/PAMY) and droughty inclusions support Douglas-fir ninebark (PSME/PHMA) vegetation.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations indicate a high mass wasting potential and a high sediment delivery efficiency rating. Other ratings are low to moderate.

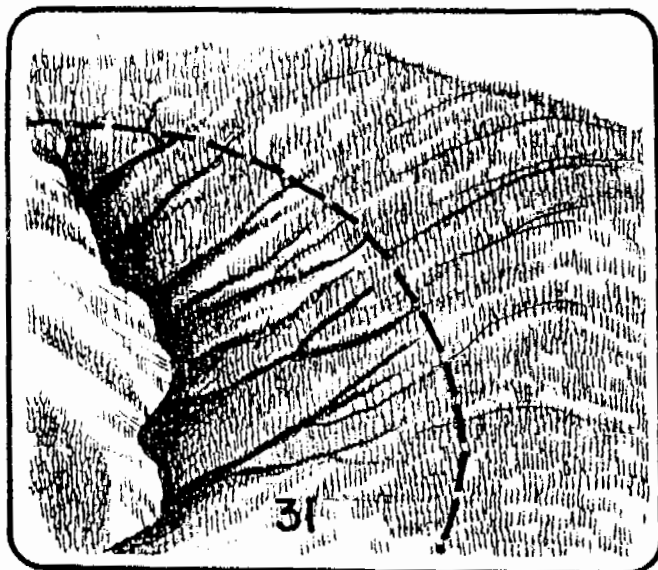
ENGINEERING - Potential road construction problems include a high mass wasting hazard and a high risk of sediment being delivered to streams. Cutbank and fill sloughing commonly require maintenance. Finer textured soils, which occur in draws, have low bearing strengths and are subject to rutting if exposed to heavy traffic when wet.

SILVICULTURE - This landtype has regeneration limitations related to high insolation rates which can be lethal to unshaded seedling.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate in potential for summer habitat. Winter range potential is rated moderate at low elevations where snow accumulation does not limit access.



LANDTYPE 31-S21



SUMMARY

Number of map delineations - 15
Total acreage - 2,100
Average map unit acreage - 138

These landtypes are located on low elevation, warm aspect, mountain slopelands. Soils are deep, well drained, and developed in volcanic ash over schist. Vegetation is grand fir/pachistima.

LANDFORM 31 MOUNTAIN SLOPELANDS

Overall relief consists of lower and midslopes of mountains and primary ridges along major drainages. Slope shapes range from straight to slightly convex-concave. Slopes are generally dissected with V-shaped draws. The drainage system has a trellis pattern.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 4,000 to 5,000 feet
- B. Slope Gradient - 30 to 60% with averages near 50%
- C. Slope Shape - Straight to slightly concave or convex
- D. Overall Relief - 500 to 1,000 feet
- E. Dissection Spacing - 500 to 1,500 feet
- F. Dissection Relief - 100 to 300 feet
- G. Dissection Density - 10 to 25 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Straight to occasionally branched dendritic with seeps and springs common forming stream heads.

STREAM DENSITY: 1-5 miles/mile²
MEAN: 3.75 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (81%)

CHANNEL TYPE: Entrenched V-channels with moderate to high energy; angular gravel-cobble substrate, good stability.

SLOPE WATER MOVEMENT: Water movement is both subsurface and surface stream flow with weak regulation; movement is rapid. Subsurface water concentrations are common on lower third of slopes.

SEDIMENT DELIVERY: Moderate on slopes, moderate to high in streams. Storage is moderate.

OTHER IMPORTANT CHARACTERISTICS: Stream channels are sensitive to debris damming and sediment loading and are subject to torrents. Snow and vegetative management can significantly alter water yields.

PARENT MATERIAL GROUP

This group includes mica schists from Wallace and St. Regis Formations of the Belt Supergroup.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations between 4,000 and 5,000 feet on high energy slopes, just below the subalpine fir zone. Soil profiles are 40+ inches deep and well drained. Surface soil is volcanic ash 10 to 30 inches thick. Subsurface soil is coarse textured with 20 to 60% rock fragments and an estimated 10 to 20% mica content.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 21" very dark brown to dark yellowish brown gravelly silt loam (volcanic ash) with moderate granular structure, very friable, slightly sticky, slightly plastic, 5 to 15% rock fragments, (range 10 to 30" thick).

Subsoil - 21 to 45" micaceous, yellowish brown very gravelly sandy loam, moderate subangular blocky structure, nonsticky, nonplastic, 20 to 60% rock fragments, (range 10 to 40" thick).

Substratum - 45 to 60"+ highly weathered and fractured mica schist with roots.

SOIL CLASSIFICATION - Typic Vitrandepts, medial/loamy, and medial/loamy-skeletal, mixed, frigid families.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - The soil type listed dominates the unit, but has a high degree of variability in relation to volcanic ash thickness, rock fragment content in the profile, and depth to bedrock. This unit also includes about 10% very deep, dark colored soils in incipient drainages which support alder. Shallow, rocky soils comprise approximately 5% of the unit and rock outcrops another 2%.

VEGETATIVE CHARACTERISTICS - The dominant habitat type in this unit is grand fir/pachistima (ARGR/PAMY). This unit occurs as a transition zone between western red cedar and subalpine fir so that inclusions of both habitat types occur in this unit. Also, approximately 10% of this unit contains alder patches along drainages.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a high mass wasting potential.

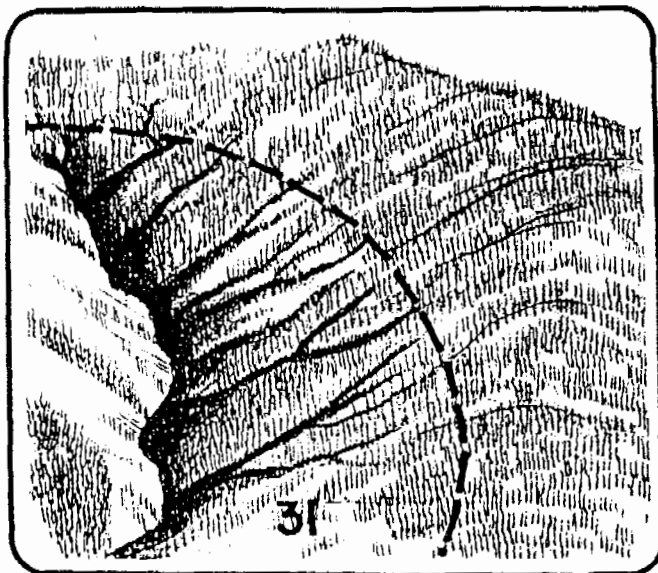
ENGINEERING - Potential road construction problems include a high mass wasting hazard and a high risk of sediment being delivered to streams. Fill sloughing is a common maintenance problem.

SILVICULTURE - This landtype has silvicultural limitations related to high insolation rates and possible brush competition.

POTENTIAL WILDLIFE HABITAT - This landtype is rated as having moderate potential for summer habitat. Potential winter habitat is rated low because of inaccessibility.



LANDTYPE 31-S25



SUMMARY

Number of map delineations - 33
Total acreage - 2,700
Average map unit acreage - 82

These landtypes are located on low elevation, warm aspect, mountain slopelands on the western end of the Forest. Soils are deep, well to somewhat excessively drained, and developed in schist. The habitat type is grand fir/pachistima.

LANDFORM 31 MOUNTAIN SLOPELANDS

Overall relief consists of lower and midslopes of mountains and primary ridges along major drainages. Slope shapes range from straight to slightly convex-concave. Slopes are generally dissected with V-shaped draws. The drainage system has a trellis pattern.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 3,000 to 4,800 feet
- B. Slope Gradient - 30 to 60% with averages near 50%
- C. Slope Shape - Straight to slightly concave or convex
- D. Overall Relief - 500 to 1,000 feet
- E. Dissection Spacing - 500 to 1,500 feet
- F. Dissection Relief - 100 to 300 feet
- G. Dissection Density - 10 to 25 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Straight to occasionally branched dendritic with seeps and springs common forming stream heads.

STREAM DENSITY: 1-5 miles/mile²
MEAN: 3.75 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (81%)

CHANNEL TYPE: Entrenched V-channels with moderate to high energy; angular gravel-cobble substrate, good stability.

SLOPE WATER MOVEMENT: Water movement is both subsurface and surface stream flow with weak regulation; movement is rapid. Subsurface water concentrations are common on lower third of slopes.

SEDIMENT DELIVERY: Moderate on slopes, moderate to high in streams. Storage is moderate.

OTHER IMPORTANT CHARACTERISTICS: Stream channels are sensitive to debris damming and sediment loading and are subject to torrents. Snow and vegetative management can significantly alter water yields.

PARENT MATERIAL GROUP

This group includes mica schist of the Wallace Formation.

SOIL-VEGETATIVE UNIT

This unit occurs below 4,800 feet elevation on high energy slopes. Soil profiles are 40+ inches deep and well to somewhat excessively drained. Surface soil is volcanic ash 0 to 15 inches thick. Subsurface soil is coarse textured with 35 to 90% rock fragments and an estimated 10 to 20% mica content.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 12" dark brown silt loam (volcanic ash) with moderate granular structure, very friable, slightly sticky, slightly plastic, 5 to 10% rock fragments, (range 0 to 15" thick).

Subsoil - 12 to 36" brown very gravelly loamy sand, structureless, friable, nonsticky, nonplastic, 35 to 90% rock fragments.

Substratum - Highly weathered mica schist.

SOIL CLASSIFICATION - Andic Xerochrept, loamy-skeletal, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - The soil type listed dominates the unit but has a high degree of variability in relation to volcanic ash thickness, rock fragment content, and depth to bedrock. Some units are totally lacking volcanic ash and tend to be more stoney. Most units have inclusions of somewhat more moist soils on north to east facing microsites which support western red cedar. About 5% of the area on strongly convex positions have shallow soils (less than 20" deep) and there is about 2% rock outcrop.

VEGETATIVE CHARACTERISTICS - This unit is dominated by grand fir/pachistima (ABGR/PAMY),

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a high mass wasting potential.

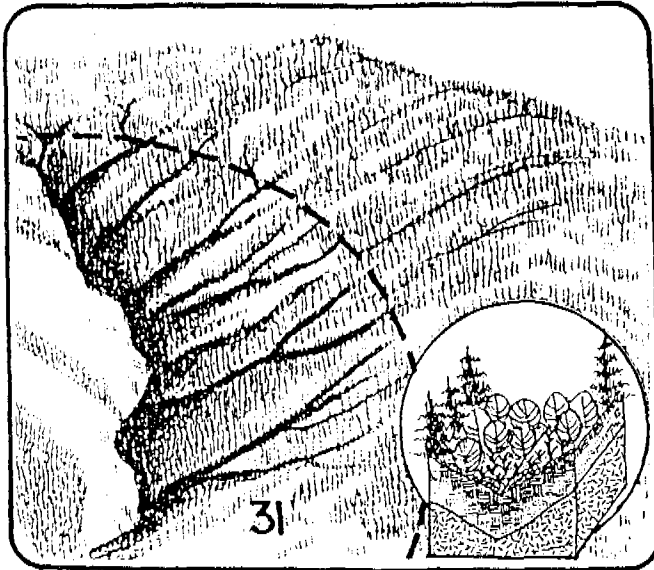
ENGINEERING - Potential road construction problems include a high sediment delivery efficiency with mass wasting as a moderate source of sediment. Cutbank sloughing, fill sloughing, and road tread erosion are common maintenance problems.

SILVICULTURE - This landtype has silvicultural limitations related to somewhat droughty soils, brush competition, high insolation rates and in areas where the volcanic ash surface soil is less than 7 inches thick.

POTENTIAL WILDLIFE HABITAT - This landtype is rated as having moderate potential for summer habitat. Potential winter habitat is rated moderate at lower elevations where snow accumulation does not limit accessibility.



LANDTYPE 31-S45



SUMMARY

Number of map delineations - 35
Total acreage - 2,500
Average map unit acreage - 72

These units are located on low elevation, mountain slope-lands. Soils are well drained on ridges, poorly drained in draws, and have deep profiles developed in micaceous schist parent material. The habitat type is western red cedar/pachistima with riparian vegetation in wet draws.

LANDFORM 31 MOUNTAIN SLOPELANDS

Overall relief consists of lower and midslopes of mountains and primary ridges along major drainages. Slope shapes range from straight to slightly convex-concave. Slopes are generally dissected with V-shaped draws. The drainage system has a trellis pattern.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 4,000 to 4,800 feet
- B. Slope Gradient - 30 to 60% with averages near 50%
- C. Slope Shape - Straight to slightly concave or convex
- D. Overall Relief - 500 to 1,000 feet
- E. Dissection Spacing - 500 to 1,500 feet
- F. Dissection Relief - 100 to 300 feet
- G. Dissection Density - 10 to 25 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Straight to occasionally branched dendritic with seeps and springs common forming stream heads.

STREAM DENSITY: 1-5 miles/mile²
MEAN: 3.75 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (81%)

CHANNEL TYPE: Entrenched V-channels with moderate to high energy; angular gravel-cobble substrate, good stability.

SLOPE WATER MOVEMENT: Water movement in draws and swales is subsurface with frequent springs, seeps, and bogs. Interfluves are fairly well drained with overland flow unlikely.

SEDIMENT DELIVERY: Moderate on slopes, moderate to high in streams. Storage is moderate.

OTHER IMPORTANT CHARACTERISTICS: Stream channels are sensitive to debris damming and sediment loading and are subject to torrents. Snow and vegetative management can significantly alter water yields.

PARENT MATERIAL GROUP

This group includes moderately weathered, micaceous schists, gneisses and interbedded pegmatites of the Belt Supergroup commonly referred to as the high grade metamorphics of the Border Zone.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,800 feet on all aspect slopes. Soil profiles are 60+ inches deep. Well drained ridge soils have a volcanic ash surface 14 to 20 inches thick. Poorly drained draw soils have a modified volcanic ash surface 12 to 20 inches thick. Subsurface soil is coarse textured with 20 to 60% rock fragments. Naturally dense fragipan layers may occur in draws resulting in perched water.

TYPICAL SOIL PROFILES

(Well drained soil)

Surface Soil - 0 to 17" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 14 to 20" thick).

Subsoil - 17 to 37" brown gravelly sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 20 to 60% rock fragments, (range 15 to 25" thick).

Substratum - 37 to 60"+ light brown gravelly sandy loam, structureless, nonsticky, nonplastic, 20 to 60% rock fragments.

(Poorly drained soil)

Surface Soil - 0 to 15" very dark brown silt loam with weak subangular blocky structure, nonsticky, nonplastic, (range 12 to 20" thick).

Subsoil - 15 to 30" dark greyish brown gravelly sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 20 to 50% rock fragments, (range 10 to 20" thick).*

Substratum - 30 to 60"+ pale brown gravelly sandy loam, structureless, nonsticky, nonplastic, 20 to 60% rock fragments.*

*NOTE: These horizons may have a naturally dense (fragipan) characteristic which may perch water and result in poor drainage.

SOIL CLASSIFICATION - Typic Vitrandepts, medial/loamy, mixed, frigid; Andic Dystrachrepts, loamy-skeletal, mixed, frigid; and Typic Haplumbrepts, medial/loamy, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Finer textured loam and silty clay loam subsoils weather from schists while sandy loam subsoils tend to derive from gneisses. These units consist of approximately 50% skeletal soils, and 50% nonskeletal soils.

VEGETATIVE CHARACTERISTICS - The dominant habitat type on well drained soils is western red cedar/pachistima. Poorly drained draws and stringers have alder, fern, and sedge vegetation with cedar on the perimeter. Subalpine fir/PAMY may occupy ridges at the higher elevation fringes of the unit.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a high rotational mass wasting potential and a high sediment delivery efficiency rating. Heavy equipment operations in wet draws can cause rutting and severe erosion into drainages.

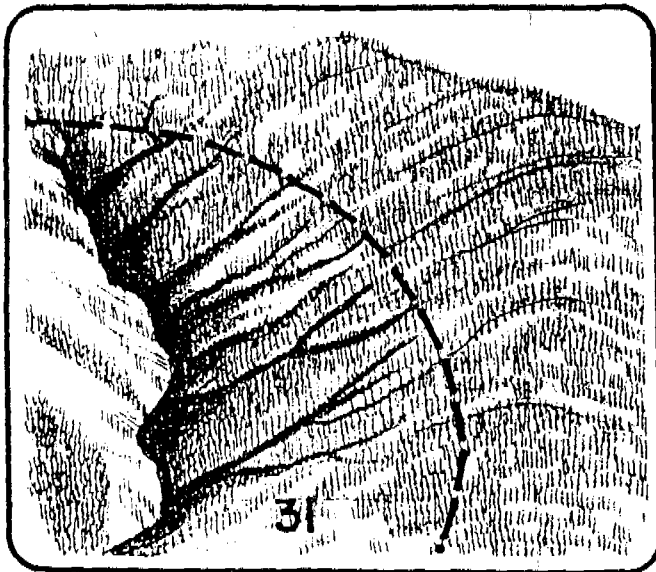
ENGINEERING - Potential road construction problems are associated with wet draws and include a high mass wasting hazard and a high risk of sediment being delivered to streams. Cutbank and fill sloughing, along with rapid brush encroachment in draws, are common maintenance problems.

SILVICULTURE - Silvicultural limitations for this landtype are related to severe brush competition, high water tables in wet draws, and dark colored umbric soils in draws. Soil compaction potential is rated high for this unit in wet areas and are susceptible to damage by heavy equipment.

POTENTIAL WILDLIFE HABITAT - This landtype is rated high in potential for summer habitat because of abundant food, water, cover, and diversity. Winter habitat potential is rated high at lower elevations where snow accumulation does not limit access.



LANDTYPE 31-T10



SUMMARY

Number of map delineations - 35
Total acreage - 4,770
Average map unit acreage -136

These units are located on low elevation, cool aspect, mountain slopelands on the west end of the Forest. Soils are deep, well drained, and developed in loess and basalt. The habitat type is western red cedar/pachistima.

LANDFORM 31 MOUNTAIN SLOPELANDS

Overall relief consists of lower and midslopes of mountains and primary ridges along major drainages. Slope shapes range from straight to slightly convex-concave. Slopes are generally dissected with V-shaped draws. The drainage system has a trellis pattern.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 2,000 to 3,600 feet
- B. Slope Gradient - 30 to 60% with averages near 50%
- C. Slope Shape - Straight to slightly concave or convex
- D. Overall Relief - 500 to 1,000 feet
- E. Dissection Spacing - 500 to 1,500 feet
- F. Dissection Relief - 100 to 300 feet
- G. Dissection Density - 10 to 25 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Straight to occasionally branched dendritic with seeps and springs common forming stream heads.

STREAM DENSITY: 1-5 miles/mile²
MEAN: 3.75 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (81%)

CHANNEL TYPE: Entrenched V-channels with moderate to high energy; angular gravel-cobble substrate, good stability.

SLOPE WATER MOVEMENT: Water movement is both subsurface and surface stream flow with weak regulation; movement is rapid. Subsurface water concentrations are common on lower third of slopes.

SEDIMENT DELIVERY: Moderate on slopes, moderate to high in streams. Storage is moderate.

OTHER IMPORTANT CHARACTERISTICS: Stream channels are sensitive to debris damming and sediment loading and are subject to torrents. Snow and vegetative management can significantly alter water yields.

PARENT MATERIAL GROUP

This group consists of Columbia River basalt with some influence from Palouse loess, Latah Interbeds, and Mazama volcanic ash.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 3,600 feet on low energy slopes. Soil profiles are 60+ inches deep. Surface soil is volcanic ash 10 to 30 inches deep. Subsurface soil is moderately fine textured with 20 to 60% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 16" dark brown silt loam (volcanic ash), medium granular structure, very friable, slightly sticky, slightly plastic, (range 10 to 30" thick).

Subsoil (1) - 16 to 32" dark brown silt loam with moderate subangular blocky structure, friable, slightly sticky, slightly plastic, 10 to 25% rock fragments, (range 10 to 40" thick).

Subsoil (2) - 32 to 60+" dark brown heavy silt loam to clay loam with moderate subangular blocky structure, friable, sticky, plastic, clay films lining pores and coating ped faces, 35 to 90 % rock fragments.

Substratum - The soil generally grades into moderately weathered, fractured basalt.

SOIL CLASSIFICATION - Eutric Glossoboralf, medial/loamy-skeletal, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - This soil occupies about 80% of this unit. On slopes less than 40% (about 10% of the unit), there are silty soils with strongly developed horizons of clay accumulation. Also included are wet soils along drainages and shallow to bedrock soils on strongly convex positions.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is western red cedar/pachistima (THPL/PAMY).

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect low to moderate potential ratings.

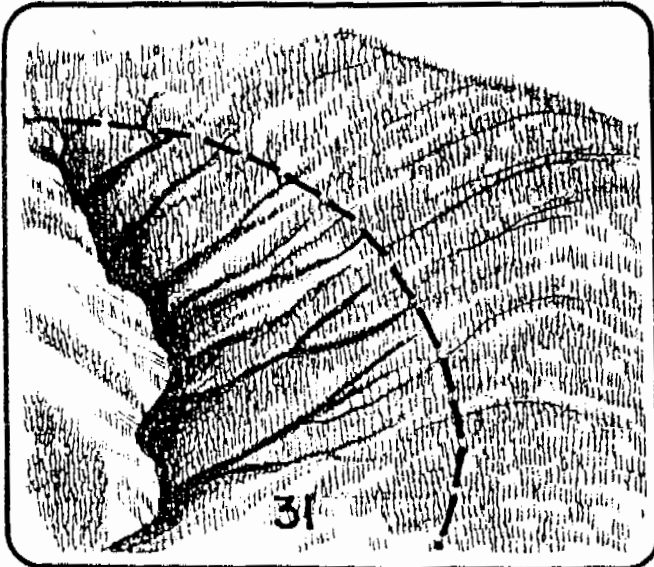
ENGINEERING - Potential road construction problems include a high sediment delivery efficiency with mass wasting as a moderate hazard for a source of sediment. Road tread rutting and erosion are common maintenance problems.

SILVICULTURE - This landtype has no major silvicultural limitations.

POTENTIAL WILDLIFE HABITAT - Potential summer habitat is rated moderate for this landtype. Potential winter habitat is rated moderate at low elevations where snow depth does not limit accessibility.



LANDTYPE 31-T20



SUMMARY

Number of map delineations - 40
Total acreage - 4,100
Average map unit acreage - 101

These units are located on low elevation, warm aspect, mountain slopelands on the western edge (Palouse District) of the Forest. Soils are deep, well drained, and developed in basalt, loess, and volcanic ash. The habitat type is western red cedar/pachistima.

LANDFORM 31 MOUNTAIN SLOPELANDS

Overall relief consists of lower and midslopes of mountains and primary ridges along major drainages. Slope shapes range from straight to slightly convex-concave. Slopes are generally dissected with V-shaped draws. The drainage system has a trellis pattern.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 2,000 to 3,600 feet
- B. Slope Gradient - 30 to 60% with averages near 50%
- C. Slope Shape - Straight to slightly concave or convex
- D. Overall Relief - 500 to 1,000 feet
- E. Dissection Spacing - 500 to 1,500 feet
- F. Dissection Relief - 100 to 300 feet
- G. Dissection Density - 10 to 25 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Straight to occasionally branched dendritic with seeps and springs common forming stream heads.

STREAM DENSITY: 1-5 miles/mile²
MEAN: 3.75 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (81%)

CHANNEL TYPE: Entrenched V-channels with moderate to high energy; angular gravel-cobble substrate, good stability.

SLOPE WATER MOVEMENT: Water movement is both subsurface and surface stream flow with weak regulation; movement is rapid. Subsurface water concentrations are common on lower third of slopes.

SEDIMENT DELIVERY: Moderate on slopes, moderate to high in streams. Storage is moderate.

OTHER IMPORTANT CHARACTERISTICS: Stream channels are sensitive to debris damming and sediment loading and are subject to torrents. Snow and vegetative management can significantly alter water yields.

PARENT MATERIAL GROUP

This group consists of Columbia River basalts with influence from Palouse loess, Latah Interbeds, and Mazama volcanic ash.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 3,600 feet on high energy slopes. Soil profiles are 60+ inches deep, well drained, and rocky. Surface soil is volcanic ash 7 to 18 inches thick. Subsurface soils are very gravelly and moderately fine textured.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 11" dark brown silt loam with weak granular structure, very friable, slightly sticky, slightly plastic, (range 7 to 18" thick).

Subsoil - 11 to 60" dark brown very gravelly silt loam to clay loam with moderate subangular blocky structure, friable, sticky, plastic, many clay films on ped faces, 40 to 80% rock fragments.

Substratum - This soil usually rests on moderately weathered fractured basalt.

SOIL CLASSIFICATION - Eutric Glossoboralf, loamy-skeletal, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - The above soil occupies about 80% of this unit, on slopes less than 40%. There are silty soils with strongly developed horizons of clay accumulation. Also included are wet soils along drainages, and shallow to bedrock soils on strongly convex positions.

VEGETATIVE CHARACTERISTICS - The dominant habitat is western red cedar/pachistima (THPL/PAMY) but on the dry end of the range. Included in this unit is 10 to 20% of the area on steep south and west facing slopes with grand fir/pachistima (ABGR/PAMY).

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect low to moderate potential ratings.

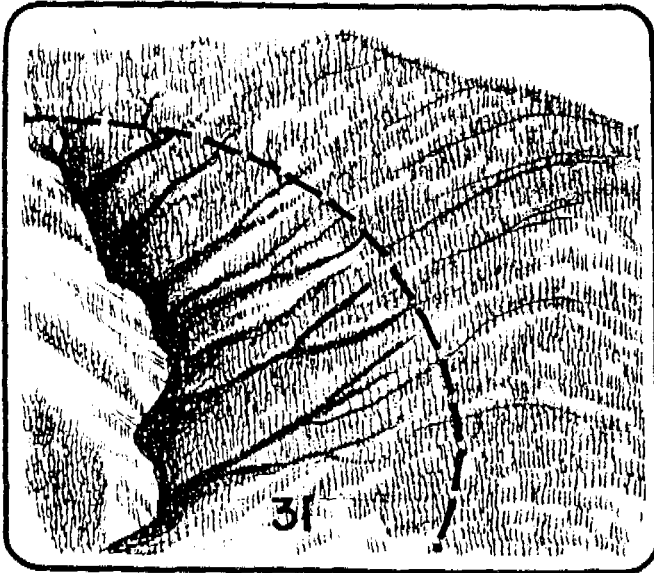
ENGINEERING - Potential road construction problems include a high sediment delivery efficiency with mass wasting as a moderate hazard for a source of sediment. Road tread rutting and erosion are common maintenance problems.

SILVICULTURE - The major silvicultural limitation is the high insolation rate on high energy slopes.

POTENTIAL WILDLIFE HABITAT - Potential summer habitat is rated moderate. Potential winter habitat is rated moderate at lower elevations where snow accumulation does not limit access.



LANDTYPE 31-T25



SUMMARY

Number of map delineations - 8
Total acreage - 2,300
Average map unit acreage - 281

These landtypes are located on low elevation, warm aspect, mountain slopelands on the western part of the Forest. Soils are deep, well to somewhat excessively drained, and developed in basalt. The habitat type is grand fir/pachistima.

LANDFORM 31 MOUNTAIN SLOPELANDS

Overall relief consists of lower and midslopes of mountains and primary ridges along major drainages. Slope shapes range from straight to slightly convex-concave. Slopes are generally dissected with V-shaped draws. The drainage system has a trellis pattern.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 2,000 to 3,600 feet
- B. Slope Gradient - 30 to 60% with averages near 50%
- C. Slope Shape - Straight to slightly concave or convex
- D. Overall Relief - 500 to 1,000 feet
- E. Dissection Spacing - 500 to 1,500 feet
- F. Dissection Relief - 100 to 300 feet
- G. Dissection Density - 10 to 25/ miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Straight to occasionally branched dendritic with seeps and springs common forming stream heads.

STREAM DENSITY: 1-5 miles/mile²
MEAN: 3.75 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (81%)

CHANNEL TYPE: Entrenched V-channels with moderate to high energy; angular gravel-cobble substrate, good stability.

SLOPE WATER MOVEMENT: Water movement is both subsurface and surface stream flow with weak regulation; movement is rapid. Subsurface water concentrations are common on lower third of slopes.

SEDIMENT DELIVERY: Moderate on slopes, moderate to high in streams. Storage is moderate.

OTHER IMPORTANT CHARACTERISTICS: Stream channels are sensitive to debris damming and sediment loading and are subject to torrents. Snow and vegetative management can significantly alter water yields.

PARENT MATERIAL GROUP

This group includes Columbia River basalt.

SOIL-VEGETATIVE UNIT

This unit occurs below 3,600 feet elevation on high energy slopes. Soil profiles are 40+ inches deep and are somewhat droughty. Surface soil is loamy, volcanic ash, influenced with organic matter darkening. Subsurface soil is silt loam to clay loam with 20 to 60% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 11" dark brown silt loam with moderate granular structure, very friable, slightly sticky, slightly plastic, (range 7 to 20" thick).

Subsoil - 11 to 50" dark brown gravelly silt loam and clay loam with moderate subangular blocky structure, friable, sticky, plastic, 20 to 60% rock fragments.

Substratum - This is primarily weathered, fractured basalt.

SOIL CLASSIFICATION - Eutric Glossoboralfs, loamy-skeletal, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - The soils in this unit vary widely in depth to bedrock and amount of rock fragments. Some units have up to 10% shallow (<20") soils. Rock fragments vary from 20 to 60% with a few units having talus slope inclusions. Many units have soils with more than 7 inches of volcanic ash, but are still somewhat droughty. Small benches and gentle slopes have silty soils with well developed horizons of clay accumulation. Most units have 2 to 5% rock outcrop.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is grand fir/pachistima (ABGR/PAMY). More moist north to east facing microsites support western red cedar/(THPL/PAMY). Steep rocky south to west facing slopes may only be Douglas-fir sites (PSME/PHMA) or even permanent grasslands.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect high sediment delivery efficiencies.

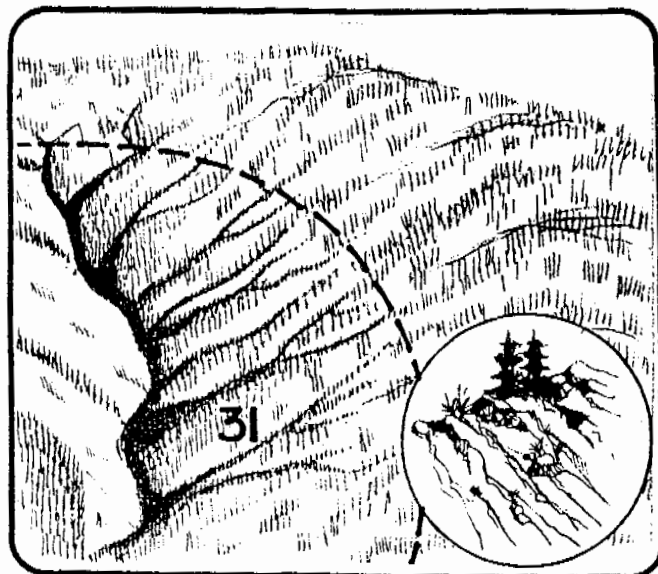
ENGINEERING - Potential road construction problems include a high sediment delivery efficiency with mass wasting as a moderate hazard for a source of sediment. Road tread rutting and erosion are common maintenance problems.

SILVICULTURE - The major silvicultural limitations for this unit are somewhat droughty soils, and high insolation rates.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate in potential for summer habitat. Winter habitat potential rating is moderate at lower elevations where snow does not limit accessibility.



LANDTYPE 31-T26



SUMMARY

Number of map delineations - 39
Total acreage - 2,900
Average map unit acreage - 74

These units are located on low elevation, warm aspect, mountain slope lands. Soils are moderately deep to deep, somewhat excessively to excessively drained, and are developed in basalt parent material. The habitat type is grand fir/pachistima. Rock outcrop comprises up to 25% of this unit.

LANDFORM 31 MOUNTAIN SLOPELANDS

Overall relief consists of lower and midslopes of mountains and primary ridges along major drainages. Slope shapes range from straight to slightly convex-concave. Slopes are generally dissected with V-shaped draws. The drainage system has a trellis pattern.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 1,600 to 4,800 feet
- B. Slope Gradient - 30 to 60% with averages near 50%
- C. Slope Shape - Straight to slightly concave or convex
- D. Overall Relief - 500 to 1,000 feet
- E. Dissection Spacing - 500 to 1,500 feet
- F. Dissection Relief - 100 to 300 feet
- G. Dissection Density - 10 to 25 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Straight to occasionally branched dendritic with seeps and springs common forming stream heads.

STREAM DENSITY: 1-5 miles/mile²
MEAN:

PRIMARY STREAM ORDER: 1 and 2

CHANNEL TYPE: Entrenched V-channels with moderate to high energy; angular gravel-cobble substrate, good stability.

SLOPE WATER MOVEMENT: Overland flow is common on portions with thin soils. Streamflow tends rapid and flashy.

SEDIMENT DELIVERY: Moderate on slopes, moderate to high in streams. Storage is moderate.

OTHER IMPORTANT CHARACTERISTICS: Stream channels are sensitive to debris damming and sediment loading and are subject to torrents. Snow and vegetative management can significantly alter water yields.

PARENT MATERIAL GROUP

This group includes moderately weathered basalts of the Columbia Plateau flows. Rock outcrop comprises up to 25% of this unit.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,800 feet on high energy slopes. Soil profiles are 40+ inches deep and are somewhat droughty. Surface soil is mixed volcanic ash 6 to 12 inches thick. Subsurface soil is fine textured with 20 to 50% rock fragments. Rock outcrop comprises up to 25% of this unit.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 9" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 6 to 12" thick).

Subsoil - 9 to 40" reddish brown gravelly silty clay loam with moderate angular blocky structure, sticky, plastic, 20 to 45% rock fragments, (range 20 to 40" thick).

Substratum - 40"+ light reddish brown gravelly silty clay loam, massive, sticky, plastic, 30 to 50% rock fragments.

SOIL CLASSIFICATION - Haploxeralfs, loamy-skeletal, mixed, frigid - Rock outcrop complex.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS -

VEGETATIVE CHARACTERISTICS - The dominant habitat type is grand fir/pachistima (ABGR/PAMY).

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a high sediment delivery efficiency.

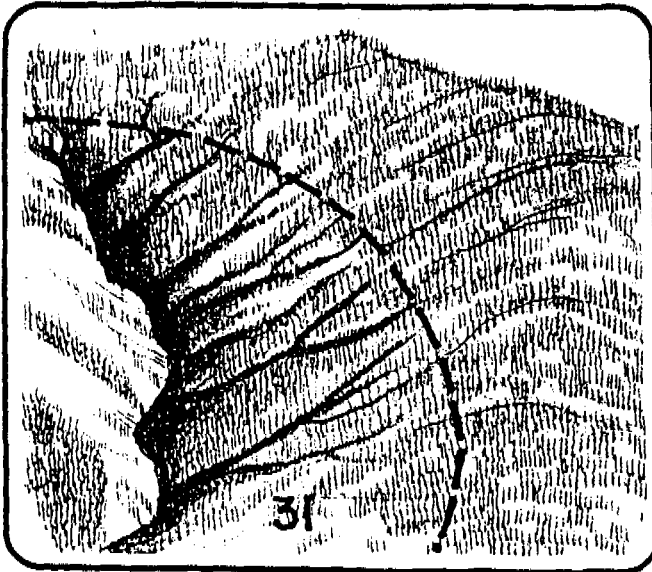
ENGINEERING - Potential road construction problems include a high sediment delivery efficiency. Road tread rutting and erosion are common maintenance problems.

SILVICULTURE - The major silvicultural limitations for this unit are the high insolation rates, droughty soils, and shallow ash surfaces.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate in potential for summer habitat, and moderate for winter habitat at lower elevations where snow depth does not limit accessibility.



LANDTYPE 31-U21



SUMMARY

Number of map delineations - 18
Total acreage - 3,800
Average map unit acreage - 210

These landtypes are located on mid-elevation, warm aspect, mountain slope lands. Soils are deep, well drained, and developed in volcanic ash over various bedrock types. Vegetation is grand fir/pachistima habitat type.

LANDFORM 31 MOUNTAIN SLOPELANDS

Overall relief consists of lower and midslopes of mountains and primary ridges along major drainages. Slope shapes range from straight to slightly convex-concave. Slopes are generally dissected with V-shaped draws. The drainage system has a trellis pattern.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 4,000 to 5,000 feet
- B. Slope Gradient - 30 to 60% with averages near 50%
- C. Slope Shape - Straight to slightly concave or convex
- D. Overall Relief - 500 to 1,000 feet
- E. Dissection Spacing - 500 to 1,500 feet
- F. Dissection Relief - 100 to 300 feet
- G. Dissection Density - 10 to 25 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Straight to occasionally branched dendritic with seeps and springs common forming stream heads.

STREAM DENSITY: 1-5 miles/mile²
MEAN: 3.75 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (81%)

CHANNEL TYPE: Entrenched V-channels with moderate to high energy; angular gravel-cobble substrate, good stability.

SLOPE WATER MOVEMENT: Water movement is both subsurface and surface stream flow with weak regulation; movement is rapid. Subsurface water concentrations are common on lower third of slopes.

SEDIMENT DELIVERY: Moderate on slopes, moderate to high in streams. Storage is moderate.

OTHER IMPORTANT CHARACTERISTICS: Stream channels are sensitive to debris damming and sediment loading and are subject to torrents. Snow and vegetative management can significantly alter water yields.

PARENT MATERIAL GROUP

This group consists of mostly quartz rich rock types including Striped Peak quartzite, Revett quartzite, Libby siltite, Wallace gneiss, and fine grained quartzitic soils around Elk River.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations between 4,000 to 5,000 feet on high energy slopes, just below the subalpine fir zone. Soil profiles are 40+ inches deep and well drained. Surface soil is volcanic ash 10 to 30 inches deep. Subsurface soil is coarse textured with 20 to 60% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 20" dark grayish to dark yellowish brown gravelly silt loam (volcanic ash) with a 6" surface horizon of organic darkening. This horizon has moderate granular structure, very friable, nonsticky, slightly plastic, and 10 to 20% rock fragments in the bottom of the layer, (range 10 to 30" thick).

Subsoil - 20 to 40" dark yellowish brown very gravelly silt loam with moderate to subangular blocky structure, firm, slightly sticky, slightly plastic, 35 to 90% rock fragments, (range 10 to 40" thick).

Substratum - Moderately decomposed quartzite.

SOIL CLASSIFICATION - Typic Vitrandept, medial/loamy-skeletal, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - The soil type listed dominates the unit but has a high degree of variability in relation to volcanic ash thickness, rock fragment content in the profile, and depth to bedrock. This unit also includes about 10% very deep, dark soils in incipient drainages which support alder. Shallow rocky soils make up about 5% of the unit and rock outcrop about 2%.

VEGETATIVE CHARACTERISTICS - The dominant habitat type in this unit is grand fir/pachistima (ABGR/PAMY). This unit occurs as a transition zone between western red cedar and subalpine fir such that inclusions of both habitat types occur in this unit. Also, this unit has about 10% alder patches along drainages.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect low to moderate potential hazard ratings.

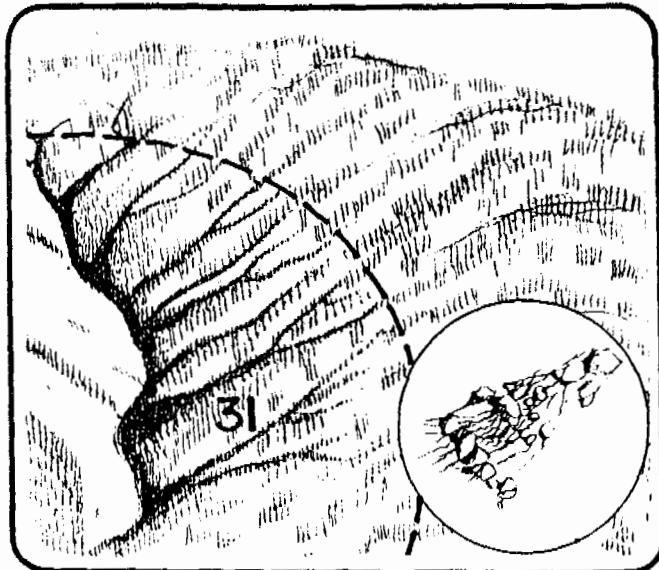
ENGINEERING - Potential road construction problems include high sediment delivery efficiency.

SILVICULTURE - This landtype has silvicultural limitations related to high insolation rates and droughty soils.

POTENTIAL WILDLIFE HABITAT - This landtype is rated as having moderate potential for summer habitat. Potential winter habitat is rated low because of inaccessibility.



LANDTYPE 31-U30



SUMMARY

Number of map delineations - 30
Total acreage - 7,700
Average map unit acreage - 255

These units are located on low elevation, warm aspect, mountain slopelands. Soils are shallow to moderately deep, excessively drained and are developed in undifferentiated parent material. The habitat type is Douglas-fir/ninebark. Shallow soil and rock outcrop comprise 30 to 60% of this unit.

LANDFORM 31 MOUNTAIN SLOPELANDS

Overall relief consists of lower and midslopes of mountains and primary ridges along major drainages. Slope shapes range from straight to slightly convex-concave. Slopes are generally dissected with V-shaped draws. The drainage system has a trellis pattern.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 1,600 to 5,000 feet
- B. Slope Gradient - 30 to 60% with averages near 50%
- C. Slope Shape - Straight to slightly concave or convex
- D. Overall Relief - 500 to 1,000 feet
- E. Dissection Spacing - 500 to 1,500 feet
- F. Dissection Relief - 100 to 300 feet
- G. Dissection Density - 10 to 25 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Straight to occasionally branched dendritic with seeps and springs common forming stream heads.

STREAM DENSITY: 1-5 miles/mile²
MEAN:

PRIMARY STREAM ORDER: 1 and 2

CHANNEL TYPE: Entrenched V-channels with moderate to high energy; angular gravel-cobble substrate, good stability.

SLOPE WATER MOVEMENT: Overland flow is common on portions with thin soils. Streamflow tends rapid and flashy.

SEDIMENT DELIVERY: Moderate on slopes, moderate to high in streams. Storage is moderate.

OTHER IMPORTANT CHARACTERISTICS: Stream channels are sensitive to debris damming and sediment loading and are subject to torrents. Snow and vegetative management can significantly alter water yields.

PARENT MATERIAL GROUP

This group consists of undifferentiated parent material. Lithology does not influence major interpretive criteria. Shallow soils and rock outcrop comprise 30 to 60% of this unit.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 5,000 feet on rocky, high energy slopes. Soil profiles are 16 to 36 inches deep and are droughty. Surface soil is thin or highly mixed volcanic ash 3 to 16 inches thick. Subsoils are coarse textured with 35 to 60% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 7" brown gravelly sandy loam with weak granular structure, nonsticky, nonplastic, 15 to 25% rock fragments, (range 3 to 16" thick).

Subsoil - 7 to 20" brown gravelly sandy loam with loose to very weak subangular blocky structure, nonsticky, nonplastic, 35 to 60% rock fragments, (range 10 to 20" thick).

Substratum - 20 to 36" pale brown loamy sand, structureless, 40 to 60% rock fragments.

SOIL CLASSIFICATION - Dystric Xerorthents, loamy-skeletal, mixed, frigid; Dystric Xerorchrepts, loamy-skeletal, mixed, frigid; and rock outcrops.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Deeper soils occur in draws and depressions. Shallow soils (less than 20" deep), occur on interfluvies and adjacent to rock outcrops. Deep soils with ash caps occur as inclusions. The soils in this unit are approximately 80% skeletal, and 20% nonskeletal.

VEGETATIVE CHARACTERISTICS - The dominant habitat types range from Douglas-fir/ninebark (PSME/PHMA) and grand fir/beargrass (ABGR/XETE) on droughty sites to grand fir/pachistima (ABGR/PAMY) on deeper, more moist soils.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect high sediment delivery efficiency. Overland flow surface erosion is common on this landtype and a major watershed objective should be to maintain a maximum vegetative cover.

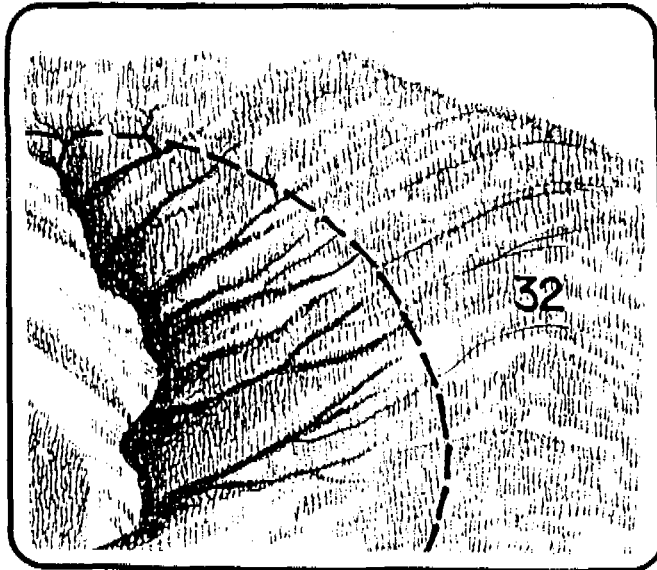
ENGINEERING - Potential road construction problems include a high sediment delivery efficiency with erosion from the excavated prism being a moderate hazard for sources of sediment. Dry cutbank raveling is a common maintenance problem. Revegetation of cuts and fills can be difficult due to high energy loading and droughty soil conditions.

SILVICULTURE - Because of droughty infertile soil and high rock outcrop content, this landtype is classified as noncommercial forest. Regeneration limitations in these rocky, droughty, high insolation rate slopes are the overriding concern.

POTENTIAL WILDLIFE HABITAT - This landtype is rated low for both potential summer and winter habitat due to the lack of food, water, and cover available.



LANDTYPE 32-K66



SUMMARY

Number of map delineations - 14
Total acreage - 2,000
Average map unit acreage - 141

These units are located on high elevation, cool aspect, rounded mountain slopelands. Soils are deep, well drained, and are developed in gussic granitic parent material. The habitat type is subalpine fir/menziesia.

LANDFORM 32 ROUNDED MOUNTAIN SLOPELANDS

Overall relief consists of upper slopes or ridgetops of middle to high elevation ridges. Slopes are rounded with weak V-shaped draws.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 4,800 to 6,000 feet
- B. Slope Gradients - 30 to 50%
- C. Slope Shape - Ridgetops are rounded and 100 to 250 feet wide. Sideslopes are weakly convex both vertically and laterally. Draws are very weakly V-shaped.
- D. Overall Relief - 300 to 750 feet
- E. Dissection Spacing - 750 to 1,750 feet
- F. Dissection Relief - 50 to 200 feet
- G. Dissection Density - 5 to 15 miles/mile

SLOPE HYDROLOGY

DRAINAGE PATTERN: Widely spaced dendritic.

STREAM DENSITY: 0-4 miles/mile²
MEAN: 2.75 miles/mile²

PRIMARY STREAM ORDER: 1-2 (95%)

CHANNEL TYPE: Slightly entrenched, wide and shallow channels with graded pool-run systems; angular gravel substrate and lands generally stable.

SLOPE WATER MOVEMENT: Well regulated subsurface flow, frequent springs and seeps with first order streams originating.

SEDIMENT DELIVERY: Low with good slope storage capacity.

OTHER IMPORTANT CHARACTERISTICS: Snow and vegetative management can alter water yield, but shape and nature of slope tends to moderate flow throughout the year.

PARENT MATERIAL GROUP

This group includes deeply weathered, gussic granitics of the Idaho Batholith. Ash material lies directly over decomposed granitic material with weak soil development and is relatively impermeable. Gussic glacial tills in the Gravey Creek areas are included in this unit.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations above 4,800 feet on low energy slopes. Soil profiles are 60+ inches deep. Surface soil is volcanic ash 10 to 18 inches thick. Subsurface soil is coarse textured with 20 to 50% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 14" very dark brown and dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 10 to 18" thick).

Subsoil - 14 to 32" brown gravelly sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 20 to 50% rock fragments, (range 7 to 28" thick).

Substratum - 32 to 60"+ pale brown gravelly loamy sand, structureless, nonsticky, nonplastic, 20 to 50% rock fragments.

SOIL CLASSIFICATION - Entic Cryandeps, medial/loamy, mixed, and Andic Cryochrepts, sandy-skeletal, mixed.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Umbric soils with dark colored surface horizons are common inclusions. These units consists of approximately 60% nonskeletal, and 40% skeletal soils.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is subalpine fir/menziesia (ABLA/MEFE).

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect high subsoil and very high parent material erosion potentials. Other ratings are low to moderate.

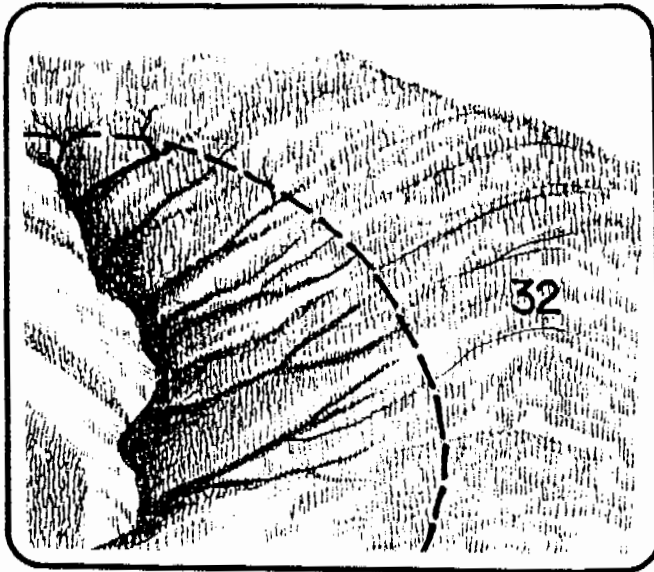
ENGINEERING - Potential road construction problems include a very high erosion rate from the excavated road prism with a moderate risk of sediment being delivered to streams. Dry cutbank raveling is a common maintenance problem.

SILVICULTURE - This landtype has silvicultural limitations caused by severe brush competition. Maintenance of the ash cap is critical to maintaining the fertility of this landtype. Large fertility differences in ash cap and underlying soil material are present.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate in potential for summer habitat and low for winter habitat due to inaccessibility.



LANDTYPE 32-L66



SUMMARY

Number of map delineations - 87
Total acreage - 20,100
Average map unit acreage - 231

These units are located on high elevation, cool aspect, rounded mountain slopes. Soils are deep, well drained, and are developed in glacial till parent material. The habitat type is subalpine fir/menziesia.

LANDFORM 32 ROUNDED MOUNTAIN SLOPELANDS

Overall relief consists of upper slopes or ridgetops of middle to high elevation ridges. Slopes are rounded with weak V-shaped draws.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 5,000 to 6,000 feet
- B. Slope Gradients - 30 to 50%
- C. Slope Shape - Ridgetops are rounded and 100 to 250 feet wide. Sideslopes are weakly convex both vertically and laterally. Draws are very weakly V-shaped.
- D. Overall Relief - 300 to 750 feet
- E. Dissection Spacing - 750 to 1,750 feet
- F. Dissection Relief - 50 to 200 feet
- G. Dissection Density - 5 to 15 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Widely spaced dendritic.

STREAM DENSITY: 0-4 miles/mile²
MEAN: 2.75 miles/mile²

PRIMARY STREAM ORDER: 1-2 (95%)

CHANNEL TYPE: Slightly entrenched, wide and shallow channels with graded pool-run systems; angular gravel substrate and lands generally stable.

SLOPE WATER MOVEMENT: Well regulated subsurface flow, frequent springs and seeps with first order streams originating.

SEDIMENT DELIVERY: Low with good slope storage capacity.

OTHER IMPORTANT CHARACTERISTICS: Snow and vegetative management can alter water yield, but shape and nature of slope tends to moderate flow throughout the year.

PARENT MATERIAL GROUP

This group consists of glacial till derived from various bedrock types and reflects the lithology of the local drainage.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations above 5,000 feet on low energy slopes. Soil profiles are 60+ inches deep. Surface soil is volcanic ash 9 to 19 inches thick. Subsurface soil is coarse textured with 20 to 60% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 13" very dark brown and dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 9 to 19" thick).

Subsoil - 13 to 32" brown gravelly sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 20 to 60% rock fragments, (range 7 to 28" thick).

Substratum - 32 to 60"+ pale brown gravelly sandy loam, structureless, nonsticky, nonplastic, 30 to 60% coarse fragments.

SOIL CLASSIFICATION - Entic Cryandepts, medial/loamy-skeletal, mixed, and Andic Cryochrepts, loamy-skeletal, mixed.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Umbric soils with dark colored surface horizons which are associated with small wet areas are common inclusions. One to 3-inch thick A1 horizons are common in this unit.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is subalpine fir/menziesia (ABLA/MEFE).

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect low to moderate potential hazard ratings.

ENGINEERING - This landtype has no significant road construction problems. Rapid brush encroachment and treadwear on rocky road surfaces are common maintenance problems.

SILVICULTURE - This landtype has silvicultural problems related to severe brush competition.

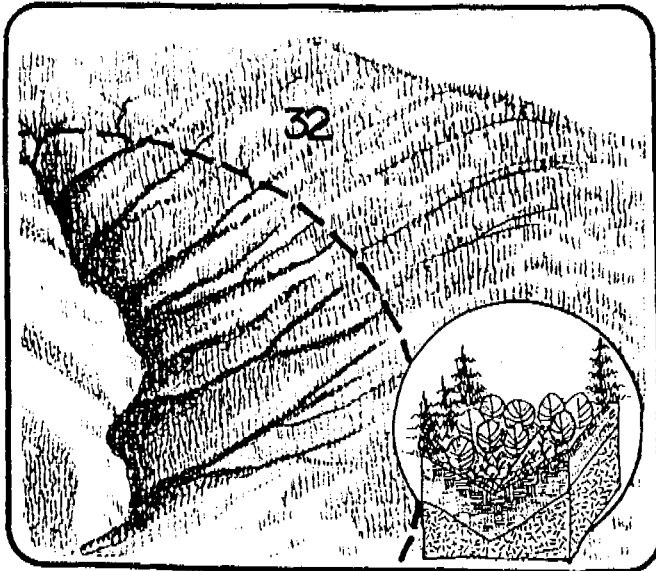
POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate in potential for summer habitat and low for winter habitat due to inaccessibility.



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LANDTYPE 32-L91



SUMMARY

Number of map delineations - 69
Total acreage - 5,400
Average map unit acreage - 78

These units are located on high elevation mountain slopelands. Soils are well drained on ridges, with poorly drained ice deposition areas, and have deep profiles developed in glacial till parent material. The habitat type is subalpine fir/pachistima with riparian vegetation in wet areas.

LANDFORM 32 ROUNDED MOUNTAIN SLOPELANDS

Overall relief consists of upper slopes or ridgetops of middle to high elevation ridges. Slopes are rounded with weak V-shaped draws.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 4,800 to 6,000 feet
- B. Slope Gradients - 30 to 50%
- C. Slope Shape - Ridgetops are rounded and 100 to 250 feet wide. Sideslopes are weakly convex both vertically and laterally. Draws are very weakly V-shaped.
- D. Overall Relief - 300 to 750 feet
- E. Dissection Spacing - 750 to 1,750 feet
- F. Dissection Relief - 50 to 200 feet
- G. Dissection Density - 5 to 15 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Widely spaced dendritic.

STREAM DENSITY: 0-4 miles/mile²
MEAN: 2.75 miles/mile²

PRIMARY STREAM ORDER: 1-2 (95%)

CHANNEL TYPE: Slightly entrenched, wide and shallow channels with graded pool-run systems; angular gravel substrate and lands generally stable.

SLOPE WATER MOVEMENT: High water tables, seeps, and springs occur over large portions of the unit for at least portions of the growing season.

SEDIMENT DELIVERY: Low with good slope storage capacity.

OTHER IMPORTANT CHARACTERISTICS: Snow and vegetative management can alter water yield, but shape and nature of slope tends to moderate flow throughout the year.

PARENT MATERIAL GROUP

This group consists of glacial tills derived from various bedrock groups and reflects the lithology of the local drainage.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations above 4,800 feet on all aspect slopes. Soil profiles are 60+ inches deep. Well drained soils have a volcanic ash surface 8 to 16 inches thick. Poorly drained soils in scoured concave areas have a darkened, modified ash surface 6 to 12 inches thick. Subsurface soil is coarse textured with 20 to 60% rock fragments. Naturally dense fragipan layers may occur in wet areas.

TYPICAL SOIL PROFILES

(Well drained soil)

Surface Soil - 0 to 14" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 8 to 16" thick).

Subsoil - 14 to 36" brown gravelly sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 30 to 40% coarse fragments, (range 20 to 30" thick).

Substratum - 36 to 60"+ light brown gravelly sandy loam, structureless, nonsticky, nonplastic, 30 to 50% coarse fragments.

(Poorly drained soil)

Surface Soil - 0 to 14" very dark brown silt loam with weak subangular blocky structure, nonsticky, nonplastic, (range 6 to 12" thick).

Subsoil - 14 to 30" dark greyish brown gravelly sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 20 to 60% coarse fragments, (range 15 to 30" thick).*

Substratum - 30 to 60"+ pale brown gravelly sandy loam, structureless, nonsticky, nonplastic, 20 to 60% coarse fragments.*

*NOTE: These horizons may have a naturally dense (fragipan) layer which can cause perching of water and poor drainage.

SOIL CLASSIFICATION - Entic Cryandepts, medial/loamy-skeletal, mixed; Andic Cryochrepts, loamy-skeletal, mixed; and Typic Cryumbrepts, loamy-skeletal, mixed.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS -

VEGETATIVE CHARACTERISTICS - The dominant habitat type on well drained ridges is subalpine fir/pachistima (ABLA/PAMY). Poorly drained areas have alder, fern, and sedge vegetation.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a high mass wasting potential hazard rating.

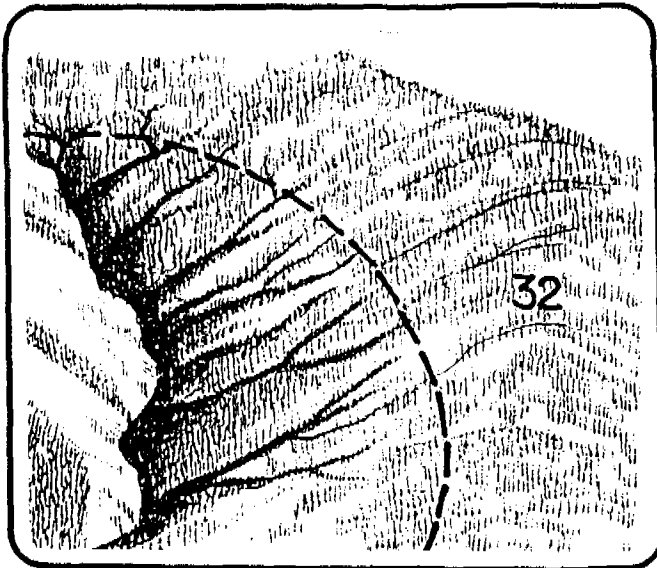
ENGINEERING - Potential road construction problems are associated with wet areas and include a high risk of mass wasting with moderate risk of sediment delivery to streams. Rapid brush encroachment and treadwear on rocky road surfaces are common maintenance problems.

SILVICULTURE - Silvicultural limitations include severe brush competition, high seasonal water tables, and dark colored umbric soils, all of which are dominant in scoured concave wet areas. Soil compaction is also rated high in wet parts of this unit. Ridges and other well drained portions of this landtype have few silvicultural limitations.

POTENTIAL WILDLIFE HABITAT - This landtype is rated high for potential summer range and low for winter habitat because of elevation.



LANDTYPE 32-R66



SUMMARY

Number of map delineations - 8
Total acreage - 2,700
Average map unit acreage - 338

These units are located on high elevation, cool aspect, rounded mountain slopelands. Soils are deep, well drained and are developed in deeply weathered Revett quartzite parent material. The habitat type is subalpine fir/menziesia. The unit only occurs in the Deception Basin area of Kelly Creek District.

LANDFORM 32 ROUNDED MOUNTAIN SLOPELANDS

Overall relief consists of upper slopes or ridgetops of middle to high elevation ridges. Slopes are rounded with weak V-shaped draws.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 4,800 to 6,000 feet
- B. Slope Gradients - 30 to 50%
- C. Slope Shape - Ridgetops are rounded and 100 to 250 feet wide. Sideslopes are weakly convex both vertically and laterally. Draws are very weakly V-shaped.
- D. Overall Relief - 300 to 750 feet
- E. Dissection Spacing - 750 to 1,750 feet
- F. Dissection Relief - 50 to 200 feet
- G. Dissection Density - 5 to 15 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Widely spaced dendritic.

STREAM DENSITY: 0-4 miles/mile²
MEAN: 2.75 miles/mile²

PRIMARY STREAM ORDER: 1-2 (95%)

CHANNEL TYPE: Slightly entrenched, wide and shallow channels with graded pool-run systems; angular gravel substrate and lands generally stable.

SLOPE WATER MOVEMENT: Well regulated subsurface flow, frequent springs and seeps with first order streams originating.

SEDIMENT DELIVERY: Low with good slope storage capacity.

OTHER IMPORTANT CHARACTERISTICS: Snow and vegetative management can alter water yield, but shape and nature of slope tends to moderate flow throughout the year.

PARENT MATERIAL GROUP

This group consists of Revett quartzite. This bedrock is located in the Osier Basin on Kelly Creek District. This is well weathered quartzite which decomposes rapidly to sand when the rock is exposed to the elements.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations above 4,800 feet on low energy slopes. Soil profiles are 60+ inches deep. Surface soil is volcanic ash 7 to 18 inches thick. Subsurface soil is medium to coarse textured with 5 to 40% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 14" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 7 to 18" thick).

Subsoil - 15 to 22" brown fine sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 5 to 20% rock fragments, (range 6 to 10" thick)

Substratum - 22 to 60"+ pale brown gravelly loamy fine sand, structureless, nonsticky, nonplastic, 10 to 40% rock fragments.

SOIL CLASSIFICATION - Entic Cryandeps, medial/loamy, mixed, and Andic Cryochrepts, coarse-loamy, mixed.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Soils commonly have a thin (1 to 3") dark colored A1 surface horizon. Degree of parent material weathering is variable. Ash caps may be mixed or missing on upper ridges and harsh exposures.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is subalpine fir/menziesia (ABLA/MEFE), with subalpine fir/beargrass (ABLA/XETE) on drier sites.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a high parent material erosion potential. Other ratings are low to moderate.

ENGINEERING - Potential road construction problems include a high erosion rate from the excavated road prism with a moderate risk of sediment delivery into streams. Cutbank and fill sloughing are common maintenance problems.

SILVICULTURE - Brush competition is the main silvicultural limitation.

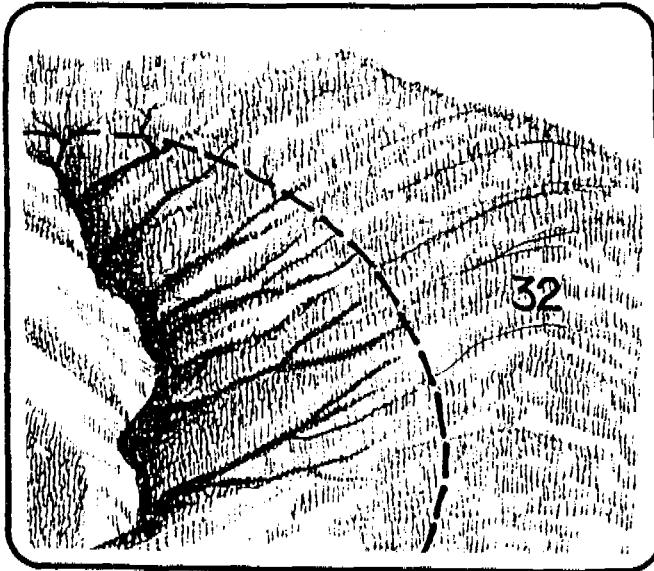
POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate in potential for summer habitat and low for winter habitat because of inaccessibility.



II-165

V83

LANDTYPE 32-S60



SUMMARY

Number of map delineations - 57
Total acreage - 4,500
Average map unit acreage - 79

These units are located on high elevation, cool aspect, rounded mountain slopelands. Soils are deep, well drained, and are developed in micaceous schist parent material. The habitat type is subalpine fir/pachistima.

LANDFORM 32 ROUNDED MOUNTAIN SLOPELANDS

Overall relief consists of upper slopes or ridgetops of middle to high elevation ridges. Slopes are rounded with weak V-shaped draws.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 4,800 to 6,000 feet
- B. Slope Gradients - 30 to 50%
- C. Slope Shape - Ridgetops are rounded and 100 to 250 feet wide. Sideslopes are weakly convex both vertically and laterally. Draws are very weakly V-shaped.
- D. Overall Relief - 300 to 750 feet
- E. Dissection Spacing - 750 to 1,750 feet
- F. Dissection Relief - 50 to 200 feet
- G. Dissection Density - 5 to 15 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Widely spaced dendritic.

STREAM DENSITY: 0-4 miles/mile²
MEAN: 2.75 miles/mile²

PRIMARY STREAM ORDER: 1-2 (95%)

CHANNEL TYPE: Slightly entrenched, wide and shallow channels with graded pool-run systems; angular gravel substrate and lands generally stable.

SLOPE WATER MOVEMENT: Well regulated subsurface flow, frequent springs and seeps with first order streams originating.

SEDIMENT DELIVERY: Low with good slope storage capacity.

OTHER IMPORTANT CHARACTERISTICS: Snow and vegetative management can alter water yield, but shape and nature of slope tends to moderate flow throughout the year.

PARENT MATERIAL GROUP

This group includes moderately weathered micaceous schists and gneisses and interbedded pegmatites of the Belt Supergroup commonly referred to as high grade metamorphics of the Border Zone.

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SOIL-VEGETATIVE UNIT

This unit occurs at elevations above 4,800 feet on low energy slopes. Soil profiles are 60+ inches deep. Surface soil is volcanic ash 10 to 20 inches thick. Subsurface soil is medium to coarse textured with 20 to 60% rock fragments and an estimated 10 to 20% mica content.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 15" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 10 to 20" thick).

Subsoil - 15 to 30" brown gravelly sandy loam to loam with weak subangular blocky structure, slightly sticky, nonplastic, 20 to 50% rock fragments, (range 10 to 20" thick).

Substratum - 30 to 60"+ pale brown gravelly sandy loam, structureless, nonsticky, nonplastic, 30 to 60% rock fragments.

SOIL CLASSIFICATION - Entic Cryandepts, medial/loamy-skeletal, mixed, and Andic Cryochrepts, coarse-loamy, mixed.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Soils with clay accumulation horizons (alfisols) occur in moist draws. A thin (1 to 3") A1 surface horizon is common.

VEGETATIVE CHARACTERISTICS - The dominant habitat types are subalpine fir/pachistima (ABLA/PAMY) and mountain hemlock/pachistima (TSME/PAMY).

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a high mass wasting potential.

ENGINEERING - Potential road construction problems are a moderate mass wasting with a moderate delivery efficiency of sediment into stream courses. Cutbank sloughing is a common maintenance problem.

SILVICULTURE - This landtype has no silvicultural limitations and all regeneration systems are available.

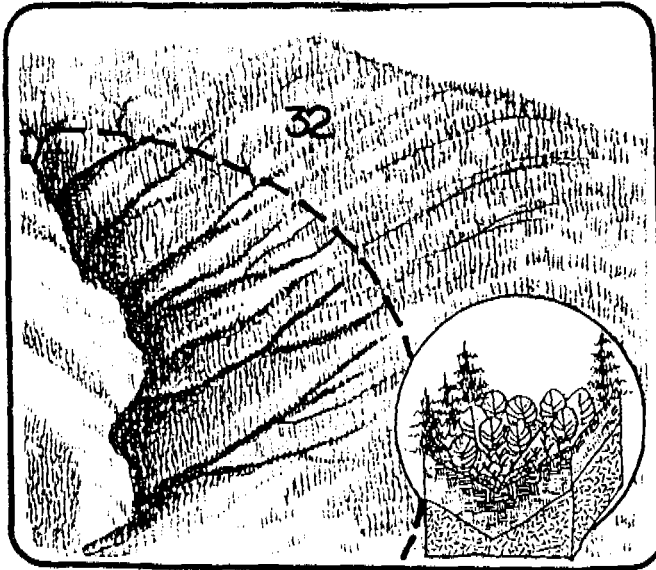
POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate in potential for summer habitat and low for winter habitat because of inaccessibility.



II-167

1/83

LANDTYPE 32-S95



SUMMARY

Number of map delineations - 12
Total acreage - 1,100
Average map unit acreage - 90

These units are located on high elevation, rounded mountain uplands. Soils are well drained on ridges, poorly drained in draws and have deep profiles developed in micaceous schist parent material. The habitat type is subalpine fir/pachistima with riparian vegetation in wet draws.

LANDFORM 32 ROUNDED MOUNTAIN SLOPELANDS

Overall relief consists of upper slopes or ridgetops of middle to high elevation ridges. Slopes are rounded with weak V-shaped draws.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 4,800 to 6,000 feet
- B. Slope Gradients - 30 to 50%
- C. Slope Shape - Ridgetops are rounded and 100 to 250 feet wide. Sideslopes are weakly convex both vertically and laterally. Draws are very weakly V-shaped.
- D. Overall Relief - 300 to 750 feet
- E. Dissection Spacing - 750 to 1,750 feet
- F. Dissection Relief - 50 to 200 feet
- G. Dissection Density - 5 to 15 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Widely spaced dendritic.

STREAM DENSITY: 0-4 miles/mile²
MEAN: 2.75 miles/mile²

PRIMARY STREAM ORDER: 1-2 (95%)

CHANNEL TYPE: Slightly entrenched, wide and shallow channels with graded pool-run systems; angular gravel substrate and lands generally stable.

SLOPE WATER MOVEMENT: High water tables, seeps, and springs occur over large portions of the unit for at least portions of the growing season.

SEDIMENT DELIVERY: Low with good slope storage capacity.

OTHER IMPORTANT CHARACTERISTICS: Snow and vegetative management can alter water yield, but shape and nature of slope tends to moderate flow throughout the year.

PARENT MATERIAL GROUP

This group includes micaceous schists and interbedded gneisses. There are Border Zone metamorphic rocks.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations above 4,800 feet on all aspect slopes. Soil profiles are 60+ inches deep. Well drained ridge soils have a volcanic ash surface 8 to 25 inches thick. Poorly drained draw soils have a darkened, modified volcanic ash surface 5 to 12 inches thick. Subsurface soil is medium to coarse textured with 10 to 60% rock fragments and an estimated 10 to 20% mica content. Naturally dense fragipan layers may occur in wet draws.

TYPICAL SOIL PROFILES

(Well drained soil)

Surface Soil - 0 to 15" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 8 to 25" thick).

Subsoil - 15 to 35" brown gravelly sandy loam - loam with weak subangular blocky structure, slightly sticky, nonplastic, 10 to 35% rock fragments, (range 12 to 40" thick).

Substratum - 35 to 60"+ pale brown gravelly sandy loam. Structureless, nonsticky nonplastic, 20 to 60% rock fragments.

(Poorly drained soil)

Surface Soil - 0 to 7" very dark brown silt loam with weak subangular blocky structure, nonsticky, nonplastic, (range 5 to 12" thick).

Subsoil - 7 to 24" dark greyish brown silt loam with weak subangular blocky structure, nonsticky, nonplastic, 10 to 15% rock fragments, (range 15 to 31" thick).*

Substratum - 24 to 60"+ pale brown gravelly sandy loam, structureless, nonsticky, nonplastic, 20 to 60% rock fragments.*

*NOTE: These horizons may have a naturally dense (fragipan) characteristic which can cause perching of water, resulting in poor drainage.

SOIL CLASSIFICATION - Andic Cryoboralfs, medial/loamy, mixed, and Andic Cryumbrepts, coarse-loamy, mixed.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Approximately 60% of soils are skeletal and 40% nonskeletal.

VEGETATIVE CHARACTERISTICS - The dominant habitat type on well drained ridges is subalpine fir/pachistima (ABLA/PAMY). Poorly drained draws support alder, fern, and sedge vegetation.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a high mass wasting potential. Other ratings are low to moderate.

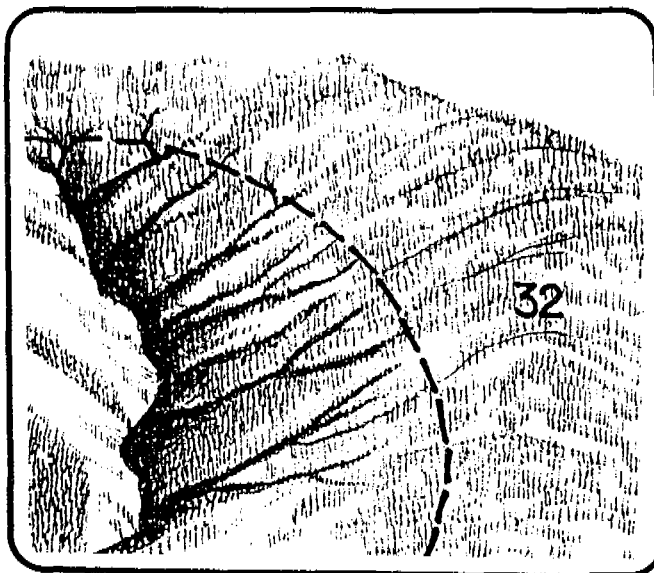
ENGINEERING - Potential road construction problems are those associated with wet draws and include a high mass wasting hazard with a moderate risk of sediment delivery into streams. Cutbank sloughing, fill sloughing, and rapid brush encroachment are maintenance problems.

SILVICULTURE - Silvicultural limitations for this landtype are seasonal high water tables, severe brush competition, and dark colored umbric soils, all of which occur in wet or moist draws. The compaction hazard in wet draws is rated high.

POTENTIAL WILDLIFE HABITAT - This landtype is rated high for summer range potential and low for winter range potential because of snow accumulations and inaccessibility.



LANDTYPE 32-U60



SUMMARY

Number of delineations - 356
Total acreage - 33,600
Average map unit acreage - 94

These units are located on high elevation, cool aspect, rounded mountain slopelands. Soils are deep, well drained, and are developed in undifferentiated parent material. The habitat type is subalpine fir/pachistima.

LANDFORM 32 ROUNDED MOUNTAIN SLOPELANDS

Overall relief consists of upper slopes or ridgetops of middle to high elevation ridges. Slopes are rounded with weak V-shaped draws.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 4,800 to 6,000 feet
- B. Slope Gradients - 30 to 50%
- C. Slope Shape - Ridgetops are rounded and 100 to 250 feet wide. Sideslopes are weakly convex both vertically and laterally. Draws are very weakly V-shaped.
- D. Overall Relief - 300 to 750 feet
- E. Dissection Spacing - 750 to 1,750 feet
- F. Dissection Relief - 50 to 200 feet
- G. Dissection Density - 5 to 15 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Widely spaced dendritic.

STREAM DENSITY: 0-4 miles/mile²
MEAN: 2.75 miles/mile²

PRIMARY STREAM ORDER: 1-2 (95%)

CHANNEL TYPE: Slightly entrenched, wide and shallow channels with graded pool-run systems; angular gravel substrate and lands generally stable.

SLOPE WATER MOVEMENT: Well regulated subsurface flow, frequent springs and seeps with first order streams originating.

SEDIMENT DELIVERY: Low with good slope storage capacity.

OTHER IMPORTANT CHARACTERISTICS: Snow and vegetative management can alter water yield, but shape and nature of slope tends to moderate flow throughout the year.

PARENT MATERIAL GROUP

This group includes undifferentiated parent material which is weak to moderately weathered. Lithologic type does not influence basic interpretive criteria used for this unit.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations above 4,800 feet on low energy slopes. Soil profiles are 60+ inches deep. Surface soil is volcanic ash 8 to 22 inches thick. Subsurface soil is coarse textured with 30 to 50% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 16" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 8 to 22" thick).

Subsoil - 16 to 28" brown gravelly sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 30 to 50% rock fragments, (range 8 to 16" thick).

Substratum - 28 to 60"+ light brown gravelly sandy loam, structureless, nonsticky, nonplastic, 30 to 50% rock fragments.

SOIL CLASSIFICATION - Entic Cryandepts, medial/loamy-skeletal, mixed, and Andic Cryochrepts, loamy-skeletal, mixed.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Soils commonly have a thin (1 to 3"), dark colored (A) surface horizon and may not be skeletal. Weakly expressed alfisols may occur in moist drainages. Approximately 60% of the soils in this unit are skeletal, and 40% are nonskeletal. Subsoils developed from siltites and argillites have silt loam textures.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is subalpine fir/pachistima (ABLA/PAMY).

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect low to moderate potential hazard ratings.

ENGINEERING - This unit has no significant road construction or maintenance problems.

SILVICULTURE - This landtype has no silvicultural limitations and all regeneration systems are available.

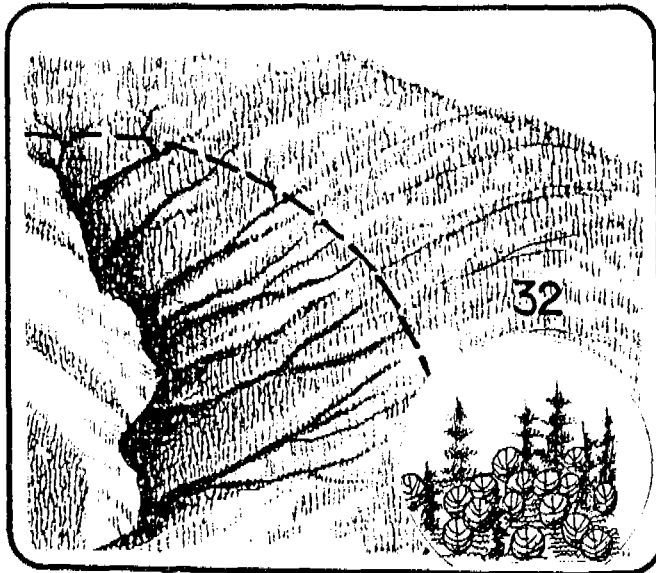
POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate in potential for summer habitat, and low for winter habitat because of inaccessibility.



10-171

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LANDTYPE 32-U61



SUMMARY

Number of map delineations - 61
Total acreage - 8,800
Average map unit acreage - 145

These units are located on high elevation, cool aspect, rounded mountain slopelands. Soils are deep, well drained, and are developed in undifferentiated parent material. The vegetation consists of shrub understory occupying at least 50% of the area.

LANDFORM 32 ROUNDED MOUNTAIN SLOPELANDS

Overall relief consists of upper slopes or ridgetops of middle to high elevation ridges. Slopes are rounded with weak V-shaped draws.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 4,800 to 6,000 feet
- B. Slope Gradients - 30 to 50%
- C. Slope Shape - Ridgetops are rounded and 100 to 250 feet wide. Sideslopes are weakly convex both vertically and laterally. Draws are very weakly V-shaped.
- D. Overall Relief - 300 to 750 feet
- E. Dissection Spacing - 750 to 1,750 feet
- F. Dissection Relief - 50 to 200 feet
- G. Dissection Density - 5 to 15 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Widely spaced dendritic.

STREAM DENSITY: 0-4 miles/mile²
MEAN: 2.75 miles/mile²

PRIMARY STREAM ORDER: 1-2 (95%)

CHANNEL TYPE: Slightly entrenched, wide and shallow channels with graded pool-run systems; angular gravel substrate and lands generally stable.

SLOPE WATER MOVEMENT: Well regulated subsurface flow, frequent springs and seeps with first order streams originating.

SEDIMENT DELIVERY: Low with good slope storage capacity.

OTHER IMPORTANT CHARACTERISTICS: Snow and vegetative management can alter water yield, but shape and nature of slope tends to moderate flow throughout the year.

PARENT MATERIAL GROUP

This group includes moderate to weakly weathered undifferentiated bedrock. Lithologic type does not influence the basic interpretive criteria for the unit.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations above 4,800 feet on low energy slopes. Soil profiles are 60+ inches deep. Surface soil is darkened, modified volcanic ash 12 to 19 inches thick. Subsurface soil is medium to coarse textured with 30 to 60% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 16" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 12 to 19" thick).

Subsoil - 16 to 33" brown gravelly sandy loam, with weak subangular blocky structure, nonsticky, nonplastic, 30 to 50% rock fragments, (range 10 to 25" thick).

Substratum - 33 to 60"+ pale brown gravelly sandy loam, structureless, nonsticky, nonplastic, 30 to 60% rock fragments.

SOIL CLASSIFICATION - Andic Cryumbrepts, loamy-skeletal, mixed, and Entic Cryandepts, medial/loamy-skeletal, mixed.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Approximately 60% of the soils in this unit are skeletal, and 40% are nonskeletal.

VEGETATIVE CHARACTERISTICS - Approximately 50% of this unit is comprised of understory shrubs including alder, menziesia, and mountain maple distributed evenly throughout. Habitat type below 4,800 feet is western red cedar/pachistima (THPL/PAMY) while above this elevation, subalpine fir/pachistima (ABLA/PAMY) is dominant. Timber is scattered evenly throughout the area and does not occur as clumps as in units with high water tables.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect low to moderate potential hazard ratings.

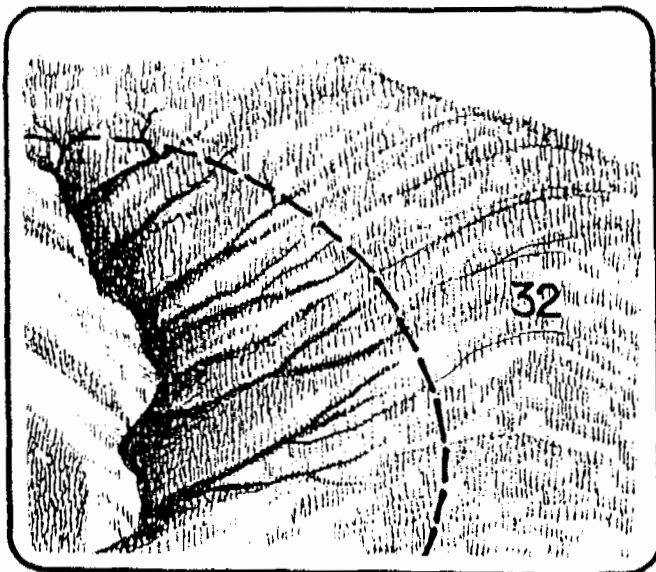
ENGINEERING - This landtype has no significant road construction problems. Brush encroachment is a maintenance problem.

SILVICULTURE - This landtype has silvicultural limitations relating to severe climax brush competition. This unit may be classed as noncommercial forest land until satisfactory methods of brush control are found.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate in potential for summer habitat and low for winter habitat because of inaccessibility.



LANDTYPE 32-U66



SUMMARY

Number of map delineations - 136
Total acreage - 13,000
Average map unit acreage - 96

These units are located on high elevation, cool aspect, rounded mountain slopelands. Soils are deep, well drained and are developed in undifferentiated parent material. The habitat type is subalpine fir/menziesia.

LANDFORM 32 ROUNDED MOUNTAIN SLOPELANDS

Overall relief consists of upper slopes or ridgetops of middle to high elevation ridges. Slopes are rounded with weak V-shaped draws.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 5,000 to 6,000 feet
- B. Slope Gradients - 30 to 50%
- C. Slope Shape - Ridgetops are rounded and 100 to 250 feet wide. Sideslopes are weakly convex both vertically and laterally. Draws are very weakly V-shaped.
- D. Overall Relief - 300 to 750 feet
- E. Dissection Spacing - 750 to 1,750 feet
- F. Dissection Relief - 50 to 200 feet
- G. Dissection Density - 5 to 15 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Widely spaced dendritic.

STREAM DENSITY: 0-4 miles/mile²
MEAN: 2.75 miles/mile²

PRIMARY STREAM ORDER: 1-2 (95%)

CHANNEL TYPE: Slightly entrenched, wide and shallow channels with graded pool-run systems; angular gravel substrate and lands generally stable.

SLOPE WATER MOVEMENT: Well regulated subsurface flow, frequent springs and seeps with first order streams originating.

SEDIMENT DELIVERY: Low with good slope storage capacity.

OTHER IMPORTANT CHARACTERISTICS: Snow and vegetative management can alter water yield, but shape and nature of slope tends to moderate flow throughout the year.

PARENT MATERIAL GROUP

This group includes moderately to weakly weathered undifferentiated bedrock. Lithologic type does not influence basic interpretative criteria used for the unit.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations above 5,000 feet on low energy slopes. Soil profiles are 60+ inches deep. Surface soil is volcanic ash 9 to 18 inches thick. Subsurface soil is coarse textured with 20 to 60% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 14" dark brown silt loam with weak, granular structure, nonsticky, nonplastic, (range 9 to 18" thick).

Subsoil - 14 to 32" brown gravelly sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 20 to 60% rock fragments, (range 13 to 56" thick).

Substratum - 32 to 60"+ pale brown gravelly sandy loam, structureless, nonsticky, nonplastic, 20 to 60% rock fragments.

SOIL CLASSIFICATION - Entic Cryandepts, medial/loamy-skeletal, mixed, and Andic Cryochrepts, loamy-skeletal, mixed.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Ash caps are commonly mixed and can contain 20 to 30% rock fragments. Thin (2 to 5") A1 horizons usually occur on the surface. Subsoils developed from siltites and argillites have silt loam textures. Soils with dark colored surface layers occur as inclusions in draws and wet areas. Approximately 60% of the soils in this unit are skeletal, 40% are nonskeletal.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is subalpine fir/menziesia (ABLA/MEFE). This habitat type normally occupies a cooler, higher elevation site than the pachistima understory.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect very low to moderate potential hazard ratings.

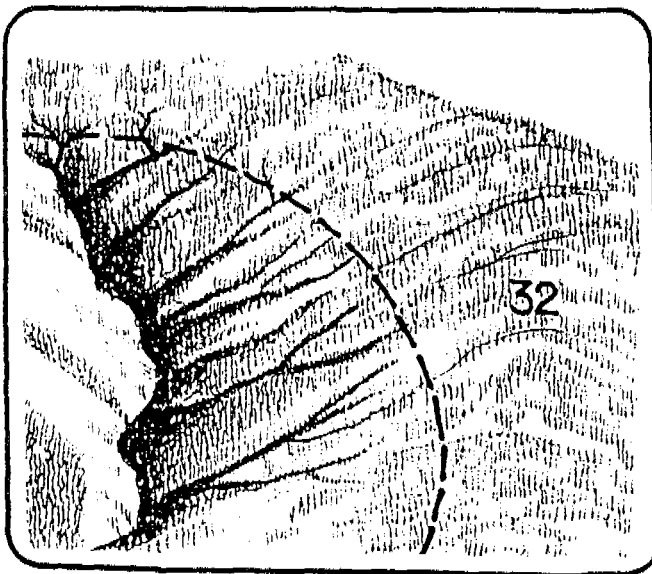
ENGINEERING - This landtype has no significant road construction problems. Brush encroachment is a maintenance problem.

SILVICULTURE - This landtype has silvicultural limitations in the form of severe climax brush competition in the menziesia habitat type. There is some evidence that hot ground fires in this unit may cause severe soil erosion.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate in potential for summer habitat, and low for winter habitat because of inaccessibility.



LANDTYPE 32-U70



SUMMARY

Number of map delineations - 145
Total acreage - 11,400
Average map unit acreage - 79

These units are located on high elevation, warm aspect, rounded mountain slopelands. Soils are deep, well drained, and are developed in undifferentiated parent material. The habitat type is subalpine fir/pachistima.

LANDFORM 32 ROUNDED MOUNTAIN SLOPELANDS

Overall relief consists of upper slopes or ridgetops of middle to high elevation ridges. Slopes are rounded with weak V-shaped draws.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 4,500 to 6,000 feet
- B. Slope Gradients - 30 to 50%
- C. Slope Shape - Ridgetops are rounded and 100 to 250 feet wide. Sideslopes are weakly convex both vertically and laterally. Draws are very weakly V-shaped.
- D. Overall Relief - 300 to 750 feet
- E. Dissection Spacing - 750 to 1,750 feet
- F. Dissection Relief - 50 to 200 feet
- G. Dissection Density - 5 to 15 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Widely spaced dendritic.

STREAM DENSITY: 0-4 miles/mile²
MEAN: 2.75 miles/mile²

PRIMARY STREAM ORDER: 1-2 (95%)

CHANNEL TYPE: Slightly entrenched, wide and shallow channels with graded pool-run systems; angular gravel substrate and lands generally stable.

SLOPE WATER MOVEMENT: Well regulated subsurface flow, frequent springs and seeps with first order streams originating.

SEDIMENT DELIVERY: Low with good slope storage capacity.

OTHER IMPORTANT CHARACTERISTICS: Snow and vegetative management can alter water yield, but shape and nature of slope tends to moderate flow throughout the year.

PARENT MATERIAL GROUP

This group includes undifferentiated parent material which is weak to moderately weathered. Lithologic type does not influence basic interpretive criteria used for this unit.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations above 4,500 feet on high energy slopes. Soil profiles are 60+ inches deep. Surface soil is mixed volcanic ash 7 to 14 inches thick. Subsurface soil is coarse textured with 30 to 50% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 10" very dark brown and dark brown silt loam with weak granular structure, nonsticky, nonplastic, 5 to 10% rock fragments, (range 7 to 14" thick).

Subsoil - 14 to 28" brown gravelly sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 30 to 50% rock fragments, (range 10 to 20" thick).

Substratum - 28 to 60"+ pale brown gravelly loamy sand, structureless, nonsticky, nonplastic, 30 to 50% rock fragments

SOIL CLASSIFICATION - Andic Cryochrepts, loamy-skeletal, mixed.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Ash caps are mixed and contain 20 to 30% coarse fragments in some areas. Soils developed from siltites and argillites have silt loam textured subsoils. Sandy loam subsoils tend to develop from other bedrock types. Approximately 80% of the soils in this unit are skeletal, 20% are nonskeletal.

VEGETATIVE CHARACTERISTICS - The habitat type is subalpine fir/pachistima (ABLA/PAMY) although it appears that this unit is on the drier end of the range. Douglas-fir and larch dominate commercial timber on the unit.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect low to moderate potential hazard ratings.

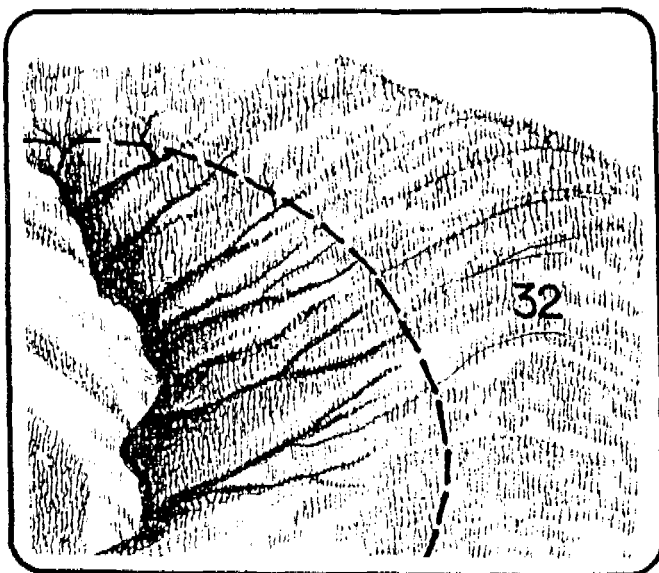
ENGINEERING - This unit has no significant road construction or maintenance problems.

SILVICULTURE - This landtype has silvicultural limitations related to one or more of the following; mixed volcanic ash surface, brush competition, or high insolation rates.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate in potential for summer habitat, and low for winter habitat because of inaccessibility.



LANDTYPE 32-U80



SUMMARY

Number of map delineations - 95
Total acreage - 7,400
Average map unit acreage - 78

These units are located on high elevation, warm aspect, rounded mountain slopes. Soils are moderately deep, excessively well drained, and are developed in undifferentiated parent material. The habitat type is subalpine fir/beargrass.

LANDFORM 32 ROUNDED MOUNTAIN SLOPELANDS

Overall relief consists of upper slopes or ridgetops of middle to high elevation ridges. Slopes are rounded with weak V-shaped draws.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 4,800 to 6,000 feet
- B. Slope Gradients - 30 to 50%
- C. Slope Shape - Ridgetops are rounded and 100 to 250 feet wide. Sideslopes are weakly convex both vertically and laterally. Draws are very weakly V-shaped.
- D. Overall Relief - 300 to 750 feet
- E. Dissection Spacing - 750 to 1,750 feet
- F. Dissection Relief - 50 to 200 feet
- G. Dissection Density - 5 to 15 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Widely spaced dendritic.

STREAM DENSITY: 0-4 miles/mile²
MEAN: 2.75 miles/mile²

PRIMARY STREAM ORDER: 1-2 (95%)

CHANNEL TYPE: Slightly entrenched, wide and shallow channels with graded pool-run systems; angular gravel substrate and lands generally stable.

SLOPE WATER MOVEMENT: Well regulated subsurface flow, frequent springs and seeps with first order streams originating.

SEDIMENT DELIVERY: Low with good slope storage capacity.

OTHER IMPORTANT CHARACTERISTICS: Snow and vegetative management can alter water yield, but shape and nature of slope tends to moderate flow throughout the year.

PARENT MATERIAL GROUP

This group includes weakly weathered, undifferentiated bedrock. Lithologic type does not influence major interpretive criteria used for the unit.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations above 4,800 feet on high energy slopes. Soil profiles are 30 to 48 inches deep and are droughty. Surface soil is volcanic ash 6 to 10 inches thick. Subsurface soil is coarse textured and has 20 to 60% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 9" dark brown and brown silt loam to sandy loam with weak granular structure, nonsticky, nonplastic, (range 6 to 10" thick).

Subsoil - 9 to 30" pale brown gravelly sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 25 to 60% rock fragments, (range 8 to 36" thick).

Substratum - 30 to 48"+ light yellowish-brown gravelly sandy loam, structureless, nonsticky, nonplastic, 35 to 60% rock fragments.

SOIL CLASSIFICATION - Andic Cryochrepts, loamy-skeletal, mixed, and Andic Cryumbrepts, loamy-skeletal, mixed.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Deeper ash soils occur at lower landscape position while shallow ash soils dominate ridgetop sites. Small areas of Umbrepts may be poorly drained. Thin (2 to 5") dark colored A1 horizons on the surface are common.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is subalpine fir/beargrass (ABLA/XETE) with subalpine fir/menziesia occupying moist draws and lower margins of the unit.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a high surface soil erosion potential. This landtype is especially susceptible to surface erosion when vegetation is completely removed as occurs in severely burned areas. Other ratings are low to moderate.

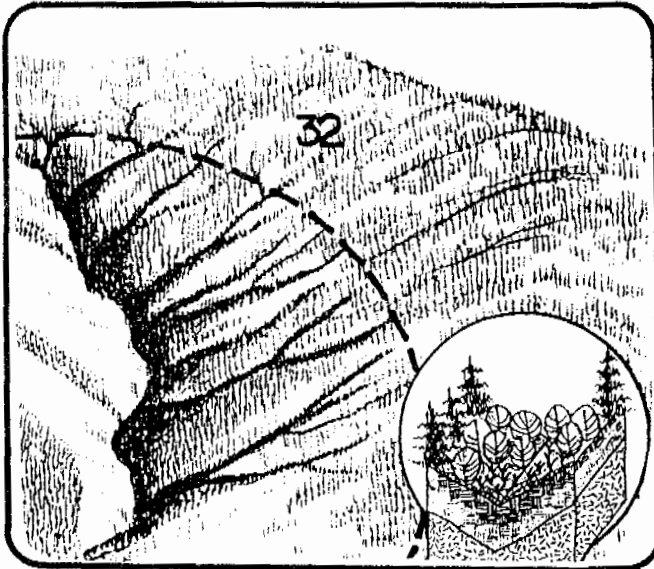
ENGINEERING - This unit has no significant road construction or maintenance problems.

SILVICULTURE - The volcanic ash is critical to the productivity of this landtype and heavy equipment operations should avoid removal or displacement of this surface layer. Ash removal results in a significant reduction in moisture holding and nutrient supplying capacity. The maintenance of woody material for replenishment of soil organic matter appears to be critical on these sites. This landtype has silvicultural limitations related to droughty soils, thin, mixed, or missing ash caps and high insolation rates on high energy slopes. Prescribed burning guides recommend low intensity fires to avoid excessive soil temperatures and resulting potential erosion.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate in potential for summer habitat and low for winter habitat because of inaccessibility.



LANDTYPE 32-U95



SUMMARY

Number of map delineations - 257
Total acreage - 22,400
Average map unit acreage - 87

These units are located on high elevation, rounded mountain uplands. Soils are well drained on ridges, poorly drained in draws and have deep profiles developed in undifferentiated parent material. The habitat type is subalpine fir/pachistima with riparian vegetation in wet draws.

LANDFORM 32 ROUNDED MOUNTAIN SLOPELANDS

Overall relief consists of upper slopes or ridgetops of middle to high elevation ridges. Slopes are rounded with weak V-shaped draws.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 4,800 to 6,000 feet
- B. Slope Gradients - 30 to 50%
- C. Slope Shape - Ridgetops are rounded and 100 to 250 feet wide. Sideslopes are weakly convex both vertically and laterally. Draws are very weakly V-shaped.
- D. Overall Relief - 300 to 750 feet
- E. Dissection Spacing - 750 to 1,750 feet
- F. Dissection Relief - 50 to 200 feet
- G. Dissection Density - 2 to 4 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Widely spaced dendritic.

STREAM DENSITY: 0-4 miles/mile²
MEAN: 2.75 miles/mile²

PRIMARY STREAM ORDER: 1-2 (95%)

CHANNEL TYPE: Slightly entrenched, wide and shallow channels with graded pool-run systems; angular gravel substrate and lands generally stable.

SLOPE WATER MOVEMENT: High water tables, seeps, and springs occur over large portions of the unit for at least portions of the growing season.

SEDIMENT DELIVERY: Low with good slope storage capacity.

OTHER IMPORTANT CHARACTERISTICS: Snow and vegetative management can alter water yield, but shape and nature of slope tends to moderate flow throughout the year.

PARENT MATERIAL GROUP

This group includes undifferentiated parent material. The lithology does not influence the major interpretive characteristics of the unit.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations above 4,800 feet on all aspect slopes. Soil profiles are 60+ inches deep. Well drained ridge soils have a volcanic ash surface 8 to 28 inches thick. Poorly drained draw soils have a darkened, modified volcanic ash surface 10 to 26 inches thick. Subsurface soil is coarse textured with 10 to 50% rock fragments. Naturally dense fragipan layers may occur in wet draws.

TYPICAL SOIL PROFILES

(Well drained soil)

Surface Soil - 0 to 18" dark brown silt loam with weak granular structure, nonsticky, nonplastic, less than 10% coarse fragments, (range 8 to 28" thick).

Subsoil - 18 to 38" brown sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 10 to 50% rock fragments, (range 12 to 30" thick).

Substratum - 38 to 60"+ pale brown sandy loam - loamy sand, structureless, nonsticky, nonplastic, 20 to 50% rock fragments.

(Poorly drained soil)

Surface Soil - (modified ash) 0 to 20" very dark brown to black silt loam, weak granular structure, slightly sticky, nonplastic, less than 10% rock fragments, (range 10 to 26" thick).

Subsoil/Substratum - 20"+ usually poorly drained, range from gleyed sandy material to gravelly clayey fragipans.

SOIL CLASSIFICATION - Entic Cryandepts, medial/loamy-skeletal, mixed; Andic Cryochrepts, Toamy-skeletal, mixed; and Typic Cryumbrepts, coarse-loamy, mixed.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Ash surfaces on well drained soils may have a darkened (A1) layer from 2 to 5 inches deep. Weakly expressed alfisols may occur in moist draws. Well drained soils are 65% skeletal and 35% nonskeletal.

VEGETATIVE CHARACTERISTICS - The dominant habitat type on well drained sites is subalpine fir/pachistima (ABLA/PAMY) and menziesia (ABLA/MEFE). Poorly drained draws support alder, fern, and sedge vegetation.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect low to moderate potential hazard ratings.

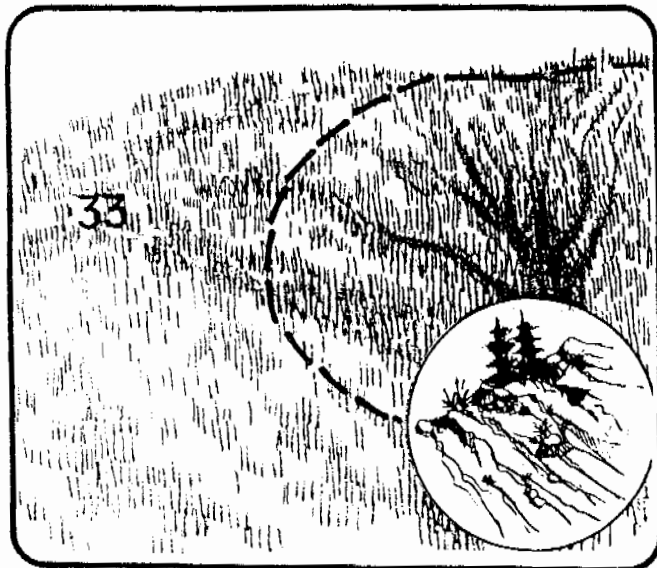
ENGINEERING - Potential road construction problems are associated with wet draws.

SILVICULTURE - Silvicultural limitations for this landtype are related to severe brush competition, high water tables, and dark colored umbric soils, all of which occur in wet draws. Soil compaction potential is rated high for this unit in wet areas which are susceptible to damage by heavy equipment. Ridges and other well drained portions of this landtype have few silvicultural limitations.

POTENTIAL WILDLIFE HABITAT - This landtype has properties such as food, water, cover, and vegetative diversity which are important components of wildlife habitat. Because of high elevation, this landtype is inaccessible in the winter and has high potential primarily as summer range.



LANDTYPE 33-K80



SUMMARY

Number of map delineations - 6
Total acreage - 1,100
Average map unit acreage - 183

These units are located on high elevation, warm aspect, broadly rounded mountain uplands. Soils are shallow to moderately deep, excessively drained, and are developed in grussic granitic parent material. The habitat type is subalpine fir/beargrass. Rock outcrop comprises up to 25% of this unit.

LANDFORM 33- BROADLY ROUNDED MOUNTAIN UPLANDS

Overall relief consists of broadly convex upper slopes and ridgetops of high elevation ridges. Frost churning is the major soil forming process.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 4,800 to 8,000 feet
- B. Slope Gradient - 20 to 35%
- C. Slope Shape - Broadly convex both vertically and laterally
- D. Overall Relief - 500 to 1,500 feet
- E. Dissection Spacing - 1,500 to absent
- F. Dissection Relief - 10 to 50 feet
- G. Dissection Density - 1 to 5 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Poorly developed and widely spaced.

STREAM DENSITY: 0-2 miles/mile²
MEAN: 0.75 miles/mile²

PRIMARY STREAM ORDER: 1 (100%)

CHANNEL TYPE: Weakly developed rectangular channels at grade; stable.

SLOPE WATER MOVEMENT: Mostly subsurface, well regulated, with significant base flows throughout the year; stream heads, if any, are lower margins of unit.

SEDIMENT DELIVERY: Very low with good slope storage capacity.

OTHER IMPORTANT CHARACTERISTICS: Snow accumulation and water yield are high, but very well regulated.

PARENT MATERIAL GROUP

These are deeply weathered grussic granitics from the Idaho Batholith. The volcanic ash surface lies directly over decomposed granitic material which is weakly developed and relatively impermeable.



SOIL-VEGETATIVE UNIT

This unit occurs at elevations above 4,800 feet on high energy slopes. Soil profiles are 20 to 40 inches deep and are droughty. Surface soil lacks appreciable volcanic ash and is coarse textured with a thickness of 4 to 8 inches. Subsoils are coarse textured and contain 30 to 60% rock fragments. Rock outcrop comprises up to 25% of this unit.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 6" brown gravelly sandy loam, weak granular structure, nonsticky, nonplastic, 15 to 25% rock fragments, (range 4 to 8 " thick).

Subsoil/Substratum - 6 to 30" pale brown very gravelly loamy sand, structureless, nonsticky, nonplastic, 30 to 60% rock fragments. Bedrock at 20 to 40" depth.

SOIL CLASSIFICATION - Typic Cryochrepts, sandy skeletal, mixed.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Ash caps are mixed and may be missing.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is subalpine fir/beargrass (ABLA/XETE).

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect high surface soil, subsoil, and parent material erosion potentials. Other ratings are very low to moderate. Vegetative cover is usually sparse because of droughty soils and rock outcrops, and should be maintained to avoid erosion.

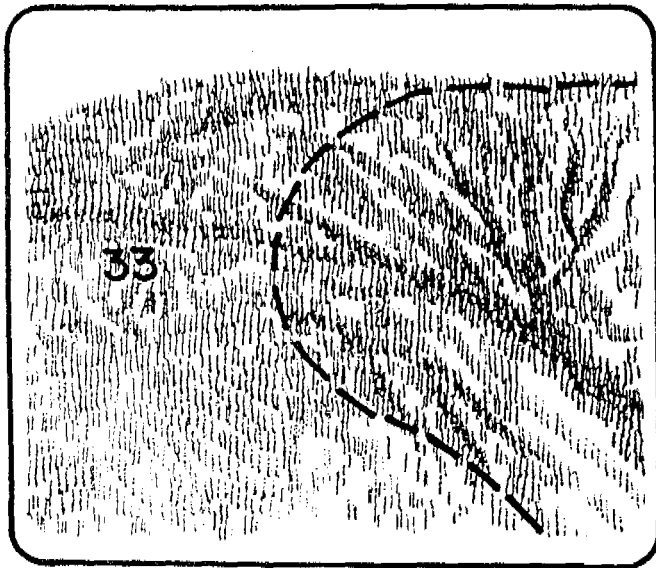
ENGINEERING - Potential road construction problems include a high rate of erosion from the excavated road prism with a low risk of sediment being delivered to streams. Dry cut raveling is a maintenance problem.

SILVICULTURE - This landtype has silvicultural limitations related to droughty soils, missing ash caps, and high insolation rates. Maintenance of the ash cap is essential to maintaining the productivity of this unit. Maintenance of woody material for replenishment of organic matter appears to be critical on these sites. Prescribed burning guides recommend low intensity fires to avoid excessive soil temperatures which can result in severe surface erosion.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate in potential for summer habitat and low for winter habitat because of elevation.



LANDTYPE 33-U66



SUMMARY

Number of map delineations - 231
Total acreage - 35,200
Average map unit acreage - 152

These units are located on high elevation, cool aspect, broadly rounded mountain uplands. Soils are deep, well drained and are developed in undifferentiated parent material. The habitat type is subalpine fir/menziesia.

LANDFORM 33- BROADLY ROUNDED MOUNTAIN UPLANDS

Overall relief consists of broadly convex upper slopes and ridgetops of high elevation ridges. Frost churning is the major soil forming process.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 5,000 to 8,000 feet
- B. Slope Gradient - 20 to 35%
- C. Slope Shape - Broadly convex both vertically and laterally
- D. Overall Relief - 500 to 1,500 feet
- E. Dissection Spacing - 1,500 to absent
- F. Dissection Relief - 10 to 50 feet
- G. Dissection Density - 1 to 5 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Poorly developed and widely spaced.

STREAM DENSITY: 0-2 miles/mile²
MEAN: 0.75 miles/mile²

PRIMARY STREAM ORDER: 1 (100%)

CHANNEL TYPE: Weakly developed rectangular channels at grade; stable.

SLOPE WATER MOVEMENT: Mostly subsurface, well regulated, with significant base flows throughout the year; stream heads, if any, are lower margins of unit.

SEDIMENT DELIVERY: Very low with good slope storage capacity.

OTHER IMPORTANT CHARACTERISTICS: Snow accumulation and water yield are high, but very well regulated.

PARENT MATERIAL GROUP

This group includes weakly weathered, undifferentiated bedrock. Lithologic type does not influence basic interpretive criteria used for the unit.



SOIL-VEGETATIVE UNIT

This unit occurs at elevations above 5,000 feet on low energy slopes. Soil profiles are 60+ inches deep. Surface soil is volcanic ash 7 to 14 inches thick. Subsurface soil is coarse textured with 25 to 60% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 12" very dark brown and dark brown silt loam with weak granular structure, nonsticky, nonplastic (range 7 to 14" thick.)

Subsoil - 14 to 32" brown gravelly sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 20 to 60% rock fragments (range 7 to 28" thick).

Substratum - 32 to 60"+ pale brown gravelly sandy loam, structureless, nonsticky, nonplastic, 30 to 60% rock fragments.

SOIL CLASSIFICATION - Andic Cryochrepts, loamy-skeletal, mixed.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Umbric soils with dark colored surface horizons are common inclusions. Deep ash surfaces occur at lower positions in the landscape. Two to five-inch thick A1 horizons are common in the unit. Mixed ash caps with 20 to 30% rock fragments can occur. Approximately 75% of the soils in this unit are skeletal, 25% are nonskeletal.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is subalpine fir/menziesia (ABLA/MEFE) with subalpine fir/pachistima (ABLA/PAMY) occurring at lower elevations.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect low to moderate potential hazard ratings.

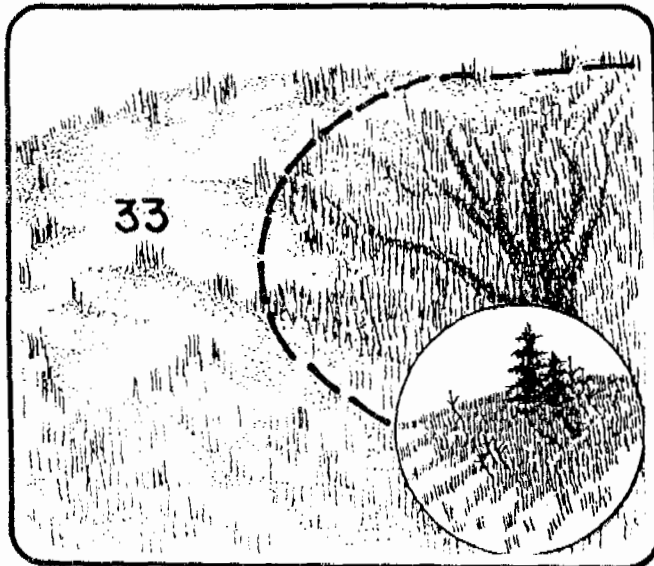
ENGINEERING - This landtype has no significant road construction problems. Fill sloughing and rapid brush encroachment are maintenance problems.

SILVICULTURE - This landtype has silvicultural limitations in the form of severe climax brush competition in the menziesia habitat type. There is some evidence that hot ground fires in this unit may cause severe soil erosion.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate in potential for summer habitat and low for winter habitat because of inaccessibility.



LANDTYPE 33-U76



SUMMARY

Number of map delineations - 38
Total acreage - 2,700
Average map unit acreage - 71

These units are located on high elevation, warm aspect, broadly rounded mountain uplands. Soils are deep, well drained and are developed from weakly weathered parent material. The dominant vegetation is grass.

LANDFORM 33- BROADLY ROUNDED MOUNTAIN UPLANDS

Overall relief consists of broadly convex upper slopes and ridgetops of high elevation ridges. Frost churning is the major soil forming process.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 4,800 to 8,000 feet
- B. Slope Gradient - 20 to 35%
- C. Slope Shape - Broadly convex both vertically and laterally
- D. Overall Relief- 500 to 1,500 feet
- E. Dissection Spacing - 1,500 to absent
- F. Dissection Relief - 10 to 50 feet
- G. Dissection Density - 1 to 5 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Poorly developed and widely spaced.

STREAM DENSITY: 0-2 miles/mile²
MEAN: 0.75 miles/mile²

PRIMARY STREAM ORDER: 1 (100%)

CHANNEL TYPE: Weakly developed rectangular channels at grade; stable.

SLOPE WATER MOVEMENT: Mostly subsurface, well regulated, with significant base flows throughout the year; stream heads, if any, are lower margins of unit.

SEDIMENT DELIVERY: Very low with good slope storage capacity.

OTHER IMPORTANT CHARACTERISTICS: Snow accumulation and water yield are high, but very well regulated.

PARENT MATERIAL GROUP

This group includes weakly weathered undifferentiated bedrock. Lithologic type does not influence basic interpretive criteria used for the unit.



SOIL-VEGETATIVE UNIT

This unit occurs at elevations above 4,800 feet on high energy slopes. Soil profiles are 60+ inches deep. Surface soil is darkened, modified volcanic ash 13 to 22 inches thick. Subsurface soil is medium to coarse textured with 30 to 60% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 18" very dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 13 to 22" thick).

Subsoil - 18 to 33" brown gravelly silt loam with weak subangular blocky structure, nonsticky, nonplastic, 30 to 60% rock fragments, (range 12 to 18" thick).

Substratum - 33 to 60"+ pale brown gravelly sandy loam, structureless, nonsticky, nonplastic, 30 to 60% rock fragments.

SOIL CLASSIFICATION - Typic Cryumbrepts, loamy-skeletal, mixed.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Approximately 85% of the soils in this unit are skeletal and 15% are nonskeletal.

VEGETATIVE CHARACTERISTICS - The dominant vegetation on at least 60% of this unit is grass. The remaining area has shrubs and conifers including subalpine fir/beargrass (ABLA/XETE) habitat type.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a high surface soil erosion potential. Other ratings are low.

ENGINEERING - This unit has no significant road construction or maintenance problems.

SILVICULTURE - This landtype is dominantly in grass vegetation and is considered noncommercial Forest Land. The soil characteristics indicate these units have been in grass vegetation for an extended period of time. Grass competition is the main silvicultural limitation.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate in potential for summer habitat, and low for winter habitat because of inaccessibility.



LANDTYPE 33-U80



SUMMARY

Number of map delineations - 309
Total acreage - 44,400
Average map unit acreage - 144

These units are located on high elevation, warm aspect, rounded mountain uplands. Soils are moderately deep, excessively drained, and are developed in undifferentiated parent material. The habitat type is subalpine fir/beargrass.

LANDFORM 33- BROADLY ROUNDED MOUNTAIN UPLANDS

Overall relief consists of broadly convex upper slopes and ridgetops of high elevation ridges. Frost churning is the major soil forming process.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 4,800 to 8,000 feet
- B. Slope Gradient - 20 to 35%
- C. Slope Shape - Broadly convex both vertically and laterally
- D. Overall Relief- 500 to 1,500 feet
- E. Dissection Spacing - 1,500 to absent
- F. Dissection Relief - 10 to 50 feet
- G. Dissection Density - 1 to 5 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Poorly developed and widely spaced.

STREAM DENSITY: 0-2 miles/mile²
MEAN: 0.75 miles/mile²

PRIMARY STREAM ORDER: 1 (100%)

CHANNEL TYPE: Weakly developed rectangular channels at grade; stable.

SLOPE WATER MOVEMENT: Mostly subsurface, well regulated, with significant base flows throughout the year; stream heads, if any, are lower margins of unit.

SEDIMENT DELIVERY: Very low with good slope storage capacity.

OTHER IMPORTANT CHARACTERISTICS: Snow accumulation and water yield are high, but very well regulated.

PARENT MATERIAL GROUP

This group includes undifferentiated bedrock. Lithologic type does not influence basic interpretative criteria for the unit.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations above 4,800 feet on high energy slopes. Soil profiles are 40 to 48 inches deep and are droughty. Surface soil is volcanic ash 6 to 17 inches thick. Subsurface soil is coarse textured with 20 to 60% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 11" brown silt loam with weak granular structure, nonsticky, nonplastic, (range 6 to 17" thick).

Subsoil - 12 to 30" pale brown gravelly sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 20 to 60% rock fragments, (range 8 to 36" thick).

Substratum - 30 to 48"+ light yellowish brown very gravelly sandy loam, structureless, nonsticky, nonplastic, 35 to 60% rock fragments.

SOIL CLASSIFICATION - Andic Cryochrepts, loamy-skeletal, mixed, and Typic Cryandeps, medial/loamy-skeletal, mixed.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - This unit has a relatively wide variation in ash cap depth and texture because of mixing and past erosion. A 2 to 5-inch thick A1 horizon is common over the unit.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is subalpine fir/beargrass (ABLA/XETE) with some higher elevations having mountain hemlock/beargrass (TSME/XETE). Lodgepole pine is usually present in seral stage.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a high surface soil erosion potential. This landtype is especially susceptible to surface erosion when vegetation is completely removed as occurs in severely burned areas. These ratings are low.

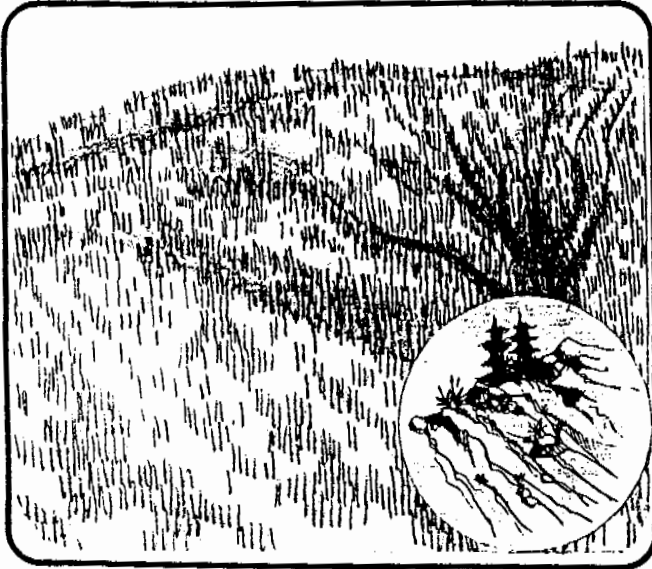
ENGINEERING - This unit has no significant road construction or maintenance problems.

SILVICULTURE - The volcanic ash is critical to the productivity of this landtype and heavy equipment operations should avoid removal or displacement of this surface layer. Ash removal results in a significant reduction in moisture holding and nutrient supplying capacity. The maintenance of woody material for replenishment of soil organic matter appears to be critical on these sites. With the ash surface soil intact, there are no major regeneration limitations on this landtype. Prescribed burning guides recommend low intensity fires to avoid excessive soil temperatures and resulting potential erosion.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate in potential for summer habitat, and low for winter habitat because of inaccessibility.



LANDTYPE 33-U86



SUMMARY

Number of map delineations - 37
Total acreage - 3,300
Average map unit acreage - 90

These units are located on high elevation, broadly rounded mountain uplands. Soils are moderately deep, excessively drained, and are developed in undifferentiated parent material. The dominant habitat type is subalpine fir/beargrass or subalpine fir/whitebark pine.

LANDFORM 33- BROADLY ROUNDED MOUNTAIN UPLANDS

Overall relief consists of broadly convex upper slopes and ridgetops of high elevation ridges. Frost churning is the major soil forming process.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 5,500 to 8,000 feet
- B. Slope Gradient - 20 to 35%
- C. Slope Shape - Broadly convex both vertically and laterally
- D. Overall Relief - 500 to 1,500 feet
- E. Dissection Spacing - 1,500 to absent
- F. Dissection Relief - 10 to 50 feet
- G. Dissection Density - 1 to 5 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Poorly developed and widely spaced.

STREAM DENSITY: 0-2 miles/mile²
MEAN: 0.75 miles/mile²

PRIMARY STREAM ORDER: 1 (100%)

CHANNEL TYPE: Weakly developed rectangular channels at grade; stable.

SLOPE WATER MOVEMENT: Mostly subsurface, well regulated, with significant base flows throughout the year; stream heads, if any, are lower margins of unit.

SEDIMENT DELIVERY: Very low with good slope storage capacity.

OTHER IMPORTANT CHARACTERISTICS: Snow accumulation and water yield are high, but very well regulated.

PARENT MATERIAL GROUP

This group includes weakly weathered undifferentiated bedrock. Lithologic type does not influence basic interpretive criteria of the unit.



SOIL-VEGETATIVE UNIT

This unit occurs at elevations above 5,500 feet on all aspect slopes. Soil profiles are 20 to 40 inches deep and are droughty. Surface soil is mixed volcanic ash 4 to 12 inches thick. Subsurface soil is mixed volcanic ash 4 to 12 inches thick. Subsurface soil is coarse textured with 30 to 70% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 8" dark brown silt loam to sandy loam with weak granular structure, nonsticky, nonplastic, (range 4 to 12" thick).

Subsoil - 6 to 15" brown gravelly sandy loam, weak subangular blocky structure, nonsticky, nonplastic, 30 to 60% rock fragments, (range 5 to 14" thick).

Substratum - 15 to 40" pale brown very gravelly sandy loam to loamy sand, structureless, nonsticky, nonplastic, 30 to 70% rock fragments.

SOIL CLASSIFICATION - Andic Cryochrepts, loamy-skeletal, mixed, and Typic Cryumbrepts, loamy-skeletal, mixed.

SOIL DISTRIBUTIONS, VARIATIONS, AND INCLUSIONS - Ash cap is mixed and depth is variable. The ash cap is severely eroded in areas subjected to intense wildfires in the past. Fragmental soils occur as inclusions.

VEGETATIVE CHARACTERISTICS - The dominant habitat types are subalpine fir/beargrass (ABLA/XETE), subalpine fir/whitebark pine (ABLA/PIAL), and subalpine fir/grouse whortleberry (ABLA/VASC).

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a high surface soil erosion potential. Removal of vegetative cover as occurs in the case of intense fires, can cause severe surface erosion. Other ratings are low.

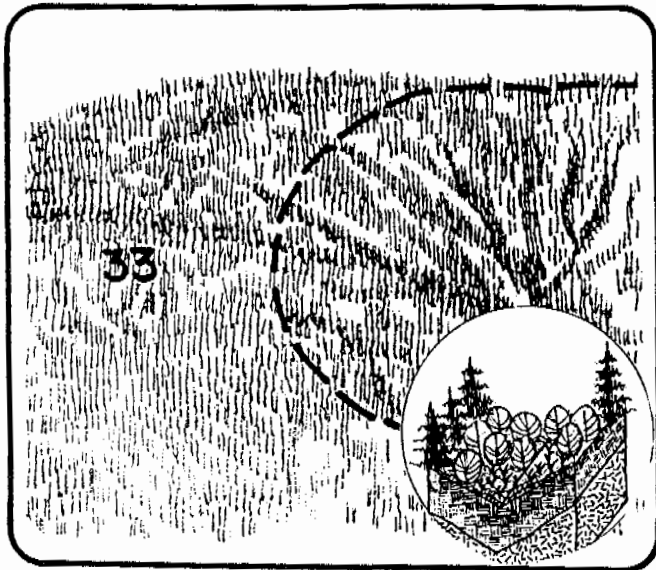
ENGINEERING - This unit has no significant road construction or maintenance problems.

SILVICULTURE - This landtype is considered noncommercial forest land. In addition to a harsh climate, regeneration is limited by droughty soils, high rock outcrop, mixed or missing ash topsoil, and high insolation rates.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate in potential for summer habitat, and low for winter habitat because of inaccessibility.



LANDTYPE 33-U95



SUMMARY

Number of map delineations - 86
Total acreage - 11,610
Average map unit acreage - 135

These units are concave inclusions in high elevation broadly rounded mountain uplands. Soils are well drained on ridges, poorly drained in concave areas, and have deep profiles developed in undifferentiated parent material. The habitat type is subalpine fir/pachistima with riparian vegetation in wet areas.

LANDFORM 33-BROADLY ROUNDED MOUNTAIN UPLANDS

Overall relief consists of broadly convex upper slopes and ridgetops of high elevation ridges. Frost churning is the major soil forming process.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 4,800 to 8,000 feet
- B. Slope Gradient - 20 to 35%
- C. Slope Shape - Broadly convex both vertically and laterally
- D. Overall Relief - 500 to 1,500 feet
- E. Dissection Spacing - 1,500 to absent
- F. Dissection Relief - 10 to 50 feet
- G. Dissection Density - 1 to 5 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Poorly developed and widely spaced.

STREAM DENSITY: 0-2 miles/mile²
MEAN: 0.75 miles/mile²

PRIMARY STREAM ORDER: 1 (100%)

CHANNEL TYPE: Weakly developed rectangular channels at grade; stable.

SLOPE WATER MOVEMENT: Mostly subsurface, well regulated, with significant base flows throughout the year; stream heads, if any, are lower margins of unit.

SEDIMENT DELIVERY: Very low with good slope storage capacity.

OTHER IMPORTANT CHARACTERISTICS: Snow accumulation and water yield are high, but very well regulated.

PARENT MATERIAL GROUP

This group includes material from the Belt quartzites, the Idaho Batholith granitics, and mixed glacial tills.



SOIL-VEGETATIVE UNIT

This unit occurs at elevations above 4,800 feet on all aspect slopes. Soil profiles are 60+ inches deep. Well drained soils have a volcanic ash surface 8 to 16 inches thick. Poorly drained draw soils have a dark organic modified volcanic ash surface 6 to 12 inches thick. Subsurface soil is coarse textured with 20 to 50% rock fragments. Naturally dense fragipan layers may occur in concave areas resulting in perched water.

TYPICAL SOIL PROFILES

(Well drained soil)

Surface Soil - 0 to 14" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 8 to 16" thick).

Subsoils - 14 to 36" brown gravelly sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 30 to 40% rock fragments, (range 20 to 30" thick).

Substratum - 36 to 60"+ light brown gravelly sandy loam structureless, nonsticky, nonplastic, 30 to 50% rock fragments.

(Poorly drained soil)

Surface Soil - 0 to 14" very dark brown silt loam with weak subangular blocky structure, nonsticky, nonplastic, (range 6 to 18" thick).

Subsoil - 14 to 30" dark greyish brown gravelly sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 20 to 60% rock fragments, (range 15 to 30" thick).*

Substratum - 30 to 60"+ pale brown gravelly sandy loam, structureless, nonsticky, nonplastic, 20 to 60% rock fragments.

*NOTE: These horizons may have a naturally dense (fragipan) layer which can cause perching of water and poor drainage.

SOIL CLASSIFICATION - Entic Cryandepts, medial/loamy-skeletal, mixed; Typic Cryumbrepts, medial/loamy-skeletal, mixed; and Aquic Fragumbrepts, loamy-skeletal, mixed.

SOIL DISTRIBUTION - Approximately 70% of the soils in this unit are skeletal, 30% are nonskeletal. Well drained soils have 2 to 5-inch surface A1 horizon. Ash caps in well drained areas may be eroded and vary in depth and mixing.

VEGETATIVE CHARACTERISTICS - The dominant habitat type on well drained sites is subalpine fir/pachistima (ABLA/PAMY) and menziesia. Poorly drained depressions have alder, fern, and sedge vegetation. Timber often occurs as clumps in this unit.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect low ratings.

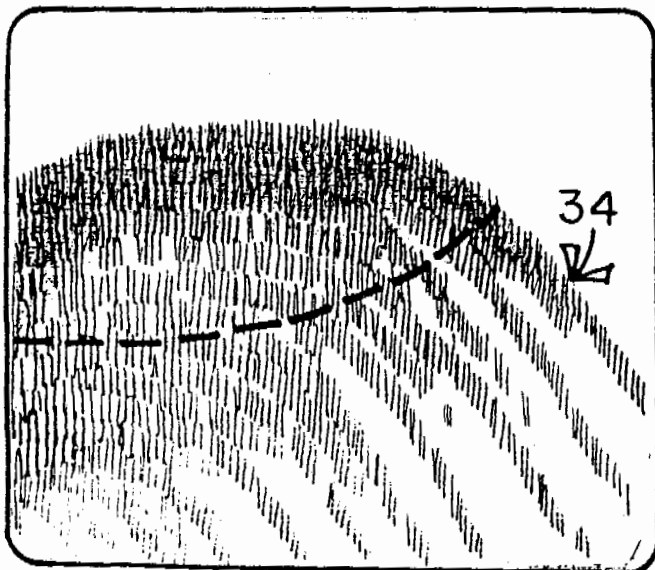
ENGINEERING - Potential road construction problems are associated with wet draws. Rapid brush encroachment and cut and fill sloughing are common maintenance problems.

SILVICULTURE - This landtype is classified as noncommercial forest land. Regeneration limitations for this unit are related to severe brush competition, high water tables, and dark colored umbric soils, all of which occur in wet draws. Soil compaction is rated high for this unit in wet areas which are susceptible to damage by heavy equipment.

POTENTIAL WILDLIFE HABITAT - This landtype has properties such as food, water, cover, and vegetative diversity which are important components of wildlife habitat. Because of the high elevation, this landtype is inaccessible in the winter and has high potential primarily as summer range.



LANDTYPE 34-U66



SUMMARY

Number of map delineations - 204
Total acreage - 18,200
Average map unit acreage - 89

These units are located on high elevation, cool aspect, steep broadly rounded mountain uplands. Soils are deep, well drained and are developed in undifferentiated parent material. The habitat type is subalpine fir/menziesia.

LANDFORM 34-STEEP, BROADLY ROUNDED MOUNTAIN UPLANDS

Overall relief consists of steep upper slopes adjacent to ridgetops of middle and high elevation ridges. Frost churning is a major soil forming process.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 5,000 to 8,000 feet
- B. Slope Gradient - 35 to 60%
- C. Slope Shape - Broadly convex both vertically and laterally
- D. Overall Relief - 500 to 1,500 feet
- E. Dissection Spacing - 1,500 to absent
- F. Dissection Relief - 10 to 50 feet
- G. Dissection Density - 1 to 5 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Poorly developed and widely spaced.

STREAM DENSITY: 0-2 miles/mile²
MEAN:

PRIMARY STREAM ORDER: 1 (100%)

CHANNEL TYPE: Weakly developed, rectangular channels at grade; stable.

SLOPE WATER MOVEMENT: Mostly subsurface, well regulated, with significant base flows throughout the year; stream headlands, if any, are along margins of unit.

SEDIMENT DELIVERY: Very low with good slope storage capacity.

OTHER IMPORTANT CHARACTERISTICS: Snow accumulation and water yield are high, but very well regulated.

PARENT MATERIAL GROUP

This group includes weakly weathered, undifferentiated bedrock. Lithologic type does not influence basic interpretive criteria used for the unit.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations above 5,000 feet on low energy slopes. Soil profiles are 60+ inches thick. Subsurface soil is coarse textured with 20 to 60% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 14" very dark brown and dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 9 to 20" thick).

Subsoil - 14 to 32" brown gravelly sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 20 to 60% rock fragments (range 7 to 28" thick).

Substratum - 32 to 60"+ pale brown gravelly sandy loam, structureless, nonsticky, nonplastic, 30 to 60% rock fragments.

SOIL CLASSIFICATION - Entic Cryandepts, medial/loamy-skeletal, mixed, and Andic Cryochrepts, loamy-skeletal, mixed.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Mixed ash caps with sandy loam textures and 20 to 30% rock fragments. Ash caps commonly have 2 to 5-inch thick A1 surface horizons. Cryumbrepts occur as inclusions in moist draws.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is subalpine fir/menziesia (ABLA/MEFE) with subalpine fir/pachistima (ABLA/PAMY) on lower elevations.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect low to moderate potential hazard ratings.

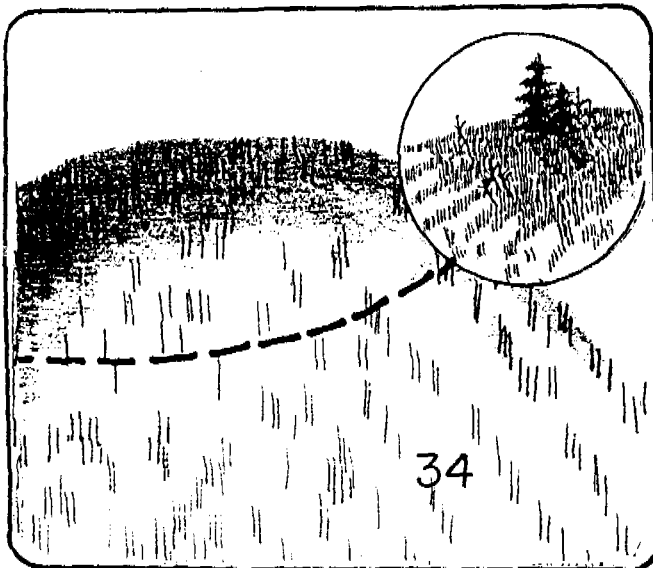
ENGINEERING - This landtype has no significant road construction problems. Rapid brush encroachment and tread wear in bouldery road surfaces are common maintenance problems.

SILVICULTURE - This landtype has silvicultural limitations in the form of severe climax brush competition in the menziesia habitat type. There is some evidence that hot ground fires in this unit may cause severe soil erosion.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate for potential summer habitat. The potential winter rating is low because of inaccessibility caused by snow accumulation.



LANDTYPE 34-U76



SUMMARY

Number of map delineations - 27
Total acreage - 3,000
Average map unit acreage - 111

These units are located on high elevation, warm aspect, steep, broadly rounded uplands. Soils are deep, well drained, and are developed in undifferentiated parent material. Vegetation is predominantly grasses with scattered shrubs.

LANDFORM 34-STEEP, BROADLY ROUNDED MOUNTAIN UPLANDS

Overall relief consists of steep upper slopes adjacent to ridgetops of middle and high elevation ridges. Frost churning is a major soil forming process.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 4,800 to 8,000 feet
- B. Slope Gradient - 35 to 60%
- C. Slope Shape - Broadly convex both vertically and laterally
- D. Overall Relief - 500 to 1,500 feet
- E. Dissection Spacing - 1,500 to absent
- F. Dissection Relief - 10 to 50 feet
- G. Dissection Density - 1 to 5 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Poorly developed and widely spaced.

STREAM DENSITY: 0-2 miles/mile²
MEAN:

PRIMARY STREAM ORDER: 1 (100%)

CHANNEL TYPE: Weakly developed, rectangular channels at grade; stable.

SLOPE WATER MOVEMENT: Mostly subsurface, well regulated, with significant base flows throughout the year; stream headlands, if any, are along margins of unit.

SEDIMENT DELIVERY: Very low with good slope storage capacity.

OTHER IMPORTANT CHARACTERISTICS: Snow accumulation and water yield are high, but very well regulated.

PARENT MATERIAL GROUP

These are weakly weathered, high elevation, undifferentiated bedrock types which do not significantly affect interpretive characteristics.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations above 4,800 feet on high energy slopes. Soil profiles are 60+ inches deep. Surface soil is darkened, modified volcanic ash 13 to 22 inches thick. Subsurface soil is medium to coarse textured with 30 to 60% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 18" very dark brown silt loam to sandy loam with weak granular structure, nonsticky, nonplastic, (range 13 to 22" thick).

Subsoil - 18 to 33" brown gravelly silt loam with weak subangular blocky structure, nonsticky, nonplastic, 30 to 60% rock fragments, (range 10 to 20" thick).

Substratum - 33 to 60"+ pale brown gravelly sandy loam, structureless, nonsticky, nonplastic, 30 to 60% rock fragments.

SOIL CLASSIFICATION - Typic Cryumbrepts, loamy-skeletal, mixed.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS -

VEGETATIVE CHARACTERISTICS - The dominant vegetation over at least 60% of this landtype is grass. Remaining areas have shrubs and conifers, including subalpine fir/beargrass (ABLA/XETE) habitat type vegetation.

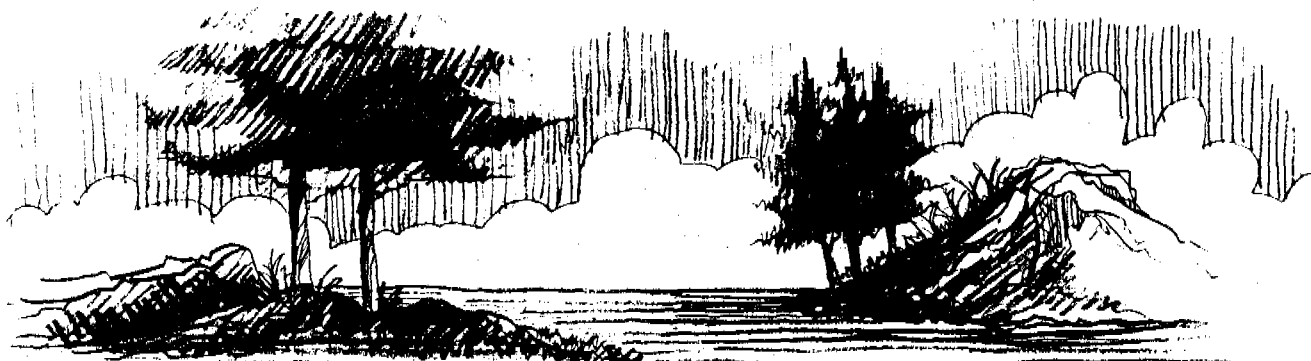
MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a high surface erosion hazard potential. Other ratings are low to moderate.

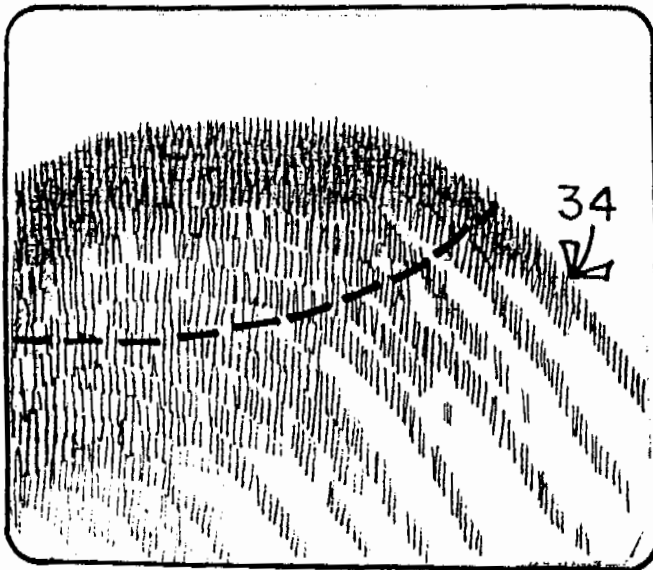
ENGINEERING - This unit has no significant road construction or maintenance problems.

SILVICULTURE - These landtypes are not normally timbered and are considered noncommercial. Major silvicultural limitations are severe grass competition and high insolation rates.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate for potential summer habitat and low for winter habitat.



LANDTYPE 34-U80



SUMMARY

Number of map delineations - 306
Total acreage - 12,700
Average map unit acreage - 41

These units are located on high elevation, steep broadly rounded mountain uplands. Soils are moderately deep, excessively well drained, and are developed in undifferentiated parent material. The habitat type is subalpine fir/beargrass.

LANDFORM 34-STEEP, BROADLY ROUNDED MOUNTAIN UPLANDS

Overall relief consists of steep upper slopes adjacent to ridgetops of middle and high elevation ridges. Frost churning is a major soil forming process.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 4,800 to 8,000 feet
- B. Slope Gradient - 35 to 60%
- C. Slope Shape - Broadly convex both vertically and laterally
- D. Overall Relief - 500 to 1,500 feet
- E. Dissection Spacing - 1,500 to absent
- F. Dissection Relief - 10 to 50 feet
- G. Dissection Density - 1 to 5 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Poorly developed and widely spaced.

STREAM DENSITY: 0-2 miles/mile²
MEAN:

PRIMARY STREAM ORDER: 1 (100%)

CHANNEL TYPE: Weakly developed, rectangular channels at grade; stable.

SLOPE WATER MOVEMENT: Mostly subsurface, well regulated, with significant base flows throughout the year; stream headlands, if any, are along margins of unit.

SEDIMENT DELIVERY: Very low with good slope storage capacity.

OTHER IMPORTANT CHARACTERISTICS: Snow accumulation and water yield are high, but very well regulated.

PARENT MATERIAL GROUP

This group includes weakly weathered undifferentiated bedrock types. The lithologic type does not influence basic interpretive criteria used for the unit.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations above 4,800 feet on all aspect slopes. Soil profiles are 30 to 48 inches deep, and are droughty. Surface soil is volcanic ash 6 to 17 inches thick. Subsurface soil is coarse textured and has 20 to 60% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 12" dark brown and brown silt loam - sandy loam with weak granular structure, nonsticky, nonplastic, 10 to 30% rock fragments, (range 6 to 17" thick).

Subsoil - 12 to 30" pale brown gravelly sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 20 to 60% rock fragments, (range 8 to 36" thick).

Substratum - 30 to 48"+ light yellowish brown very gravelly sandy loam, structureless, nonsticky, nonplastic, 35 to 60% rock fragments.

SOIL CLASSIFICATION - Andic Cryochrepts, loamy-skeletal, mixed, and Typic Cryochrepts, loamy-skeletal, mixed.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Mixed ash caps with sandy loam textures and 20 to 30% rock fragments are common variations in the unit. Ash caps commonly have 2 to 5-inch thick A1 surface horizons.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is subalpine fir/beargrass (ABLA/XETE) with some higher elevations having mountain hemlock/beargrass (TSME/XETE). Lodgepole pine is usually present in the seral stage.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a high surface soil erosion potential. This landtype is especially susceptible to surface erosion when vegetation is completely removed as occurs in severely burned areas. These ratings are low to moderate.

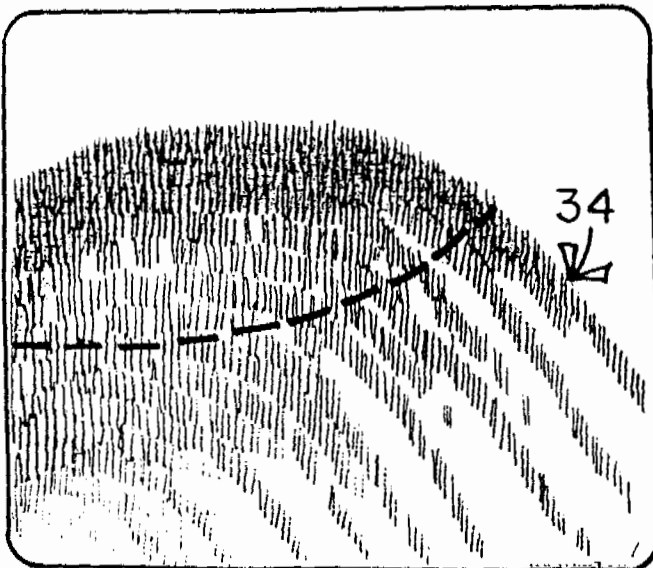
ENGINEERING - This unit has no significant road construction or maintenance problems.

SILVICULTURE - The volcanic ash is critical to the productivity of this landtype and heavy equipment operations should avoid removal or displacement of this surface layer. Ash removal results in a significant reduction in moisture holding and nutrient supplying capacity. The maintenance of woody material for replenishment of soil organic matter, appears to be critical on these sites. This landtype has silvicultural limitations related to high insolation rates on high energy slopes. Prescribed burning guides recommend low intensity fires to avoid excessive soil temperatures and resulting potential erosion.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate in potential for summer habitat, and low for winter habitat because of inaccessibility.



LANDTYPE 34-U86



SUMMARY

Number of map delineations - 44
Total acreage - 3,600
Average map unit acreage - 82

These units are located on high elevation, warm aspect, steep broadly rounded uplands. Soils are shallow to moderately deep, excessively drained, and are developed in undifferentiated parent material. Vegetation is subalpine fir/grouse whortleberry or subalpine fir/whitebark pine.

LANDFORM 34-STEEP, BROADLY ROUNDED MOUNTAIN UPLANDS

Overall relief consists of steep upper slopes adjacent to ridgetops of middle and high elevation ridges. Frost churning is a major soil forming process.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 5,500 to 8,000 feet
- B. Slope Gradient - 35 to 60%
- C. Slope Shape - Broadly convex both vertically and laterally
- D. Overall Relief - 500 to 1,500 feet
- E. Dissection Spacing - 1,500 to absent
- F. Dissection Relief - 10 to 50 feet
- G. Dissection Density - 1 to 5 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Poorly developed and widely spaced.

STREAM DENSITY: 0-2 miles/mile²

MEAN:

PRIMARY STREAM ORDER: 1 (100%)

CHANNEL TYPE: Weakly developed, rectangular channels at grade; stable.

SLOPE WATER MOVEMENT: Mostly subsurface, well regulated, with significant base flows throughout the year; stream headlands, if any, are along margins of unit.

SEDIMENT DELIVERY: Very low with good slope storage capacity.

OTHER IMPORTANT CHARACTERISTICS: Snow accumulation and water yield are high, but very well regulated.

PARENT MATERIAL GROUP

These are weakly weathered, high elevation bedrock types. Lithology does not significantly affect interpretive characteristics.

LANDTYPE 34-U86

SOIL-VEGETATIVE UNIT

This unit occurs at elevations above 5,500 feet on high energy slopes. Soil profiles are 20 to 48 inches deep. Surface soil is mixed or missing volcanic ash, and is 4 to 12 inches thick. Subsurface soil is coarse textured with 30 to 70% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 8" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 4 to 12" thick).

Subsoil - 6 to 15" brown gravelly sandy loam, weak subangular blocky structure, nonsticky, nonplastic, 30 to 60% rock fragments, (range 5 to 20" thick).

Substratum - 15 to 40" pale brown very gravelly sandy loam to loamy sand, structureless, nonsticky, nonplastic, 50 to 70% rock fragments.

SOIL CLASSIFICATION - Typic Cryochrepts, loamy-skeletal, mixed, and Andic Cryochrepts, loamy-skeletal, mixed.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Ash cap is mixed and depth is variable. The ash cap is severely eroded in areas subjected to intense wildfires in the past.

VEGETATIVE CHARACTERISTICS - Dominant habitat types are subalpine fir/grouse whortleberry (ABLA/VASC), subalpine fir/whitebark pine (ABLA/PIAL), and subalpine fir/beargrass (ABLA/XETE).

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a high surface erosion hazard potential. Other ratings are low to medium.

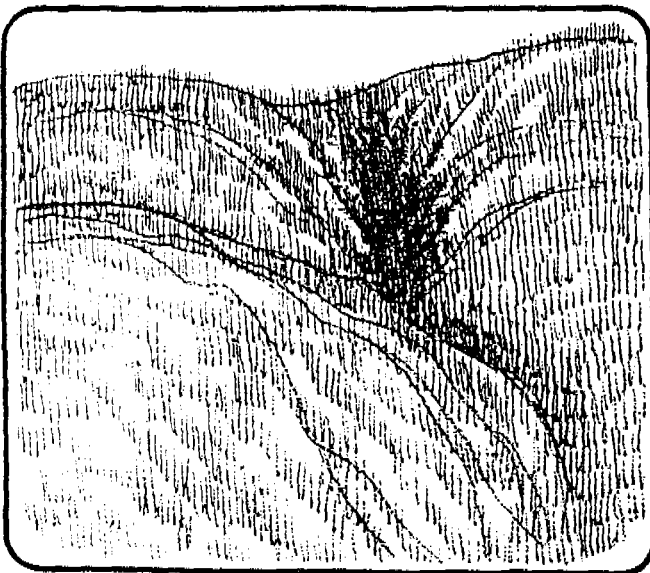
ENGINEERING - This unit has no significant road construction or maintenance problems.

SILVICULTURE - This landtype is classified as noncommercial forest land.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate in potential for summer habitat, and low for winter habitat because of inaccessibility.



LANDTYPE 36-L66



SUMMARY

Number of map delineations - 23
Total acreage - 1,500
Average map unit acreage - 65

These units are located on high elevation, cool aspect concave headlands. Soils are deep, well drained, and are developed in glacial till parent material. The habitat type is subalpine fir/menziesia.

LANDFORM 36-HIGH ELEVATION CONCAVE HEADLANDS

Overall relief consists of small concave inverted teardrop-shaped landforms which occur at high elevations in association with broad convex landforms. These landforms act as concave catch basins.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 5,000 to 7,000 feet
- B. Slope Gradient - 30 to 60%
- C. Slope Shape - Concave both vertically and laterally. Surface topography is hummocky and may be stair-stepped
- D. Overall Relief - 200 to 750 feet
- E. Dissection Relief - 5 to 20 feet
- F. Dissection Density - 5 to 10 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Seeps, bogs, stream heads, poorly developed streams.

STREAM DENSITY: 1-7 miles/mile²
MEAN: 4.00 miles/mile²

PRIMARY STREAM ORDER: 1 (100%)

CHANNEL TYPE: Poorly developed, usually associated with seeps or bogs.

SLOPE WATER MOVEMENT: These are areas of subsurface water concentration. High water occurs in central and lower portions of the unit for most of the year. A single stream usually originates in the unit.

SEDIMENT DELIVERY: Low.

PARENT MATERIAL GROUP

This group includes glacial till from various bedrock types and reflects the lithology of the local drainage.



SOIL-VEGETATIVE UNIT

This unit occurs at elevations above 5,000 feet on low energy slopes. Soil profiles are 60+ inches deep. Surface soil is volcanic ash 9 to 20 inches thick. Subsurface soil is coarse textured with 20 to 60% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 14" very dark brown and dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 9 to 20" thick).

Subsoil - 14 to 32" brown gravelly sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 20 to 60% rock fragments (range 7 to 28" thick).

Substratum - 32 to 60"+ pale brown gravelly sandy loam, structureless, nonsticky, nonplastic, 30 to 60% rock fragments.

SOIL CLASSIFICATION - Entic Cryandepts, medial/loamy-skeletal, mixed, and Andic Cryochrepts, loamy-skeletal, mixed.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Umbric soils with dark colored surface horizons and small poorly drained areas are common inclusions. Two to five-inch surface A1 horizons are common throughout the unit.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is subalpine fir/menziesia (ABLA/MEFE).

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect low to moderate potential hazard ratings.

ENGINEERING - This landtype has no significant road construction problems. Rapid brush encroachment and treadwear in road surfaces are maintenance problems.

SILVICULTURE - The major regeneration limitation for this landtype is severe brush competition.

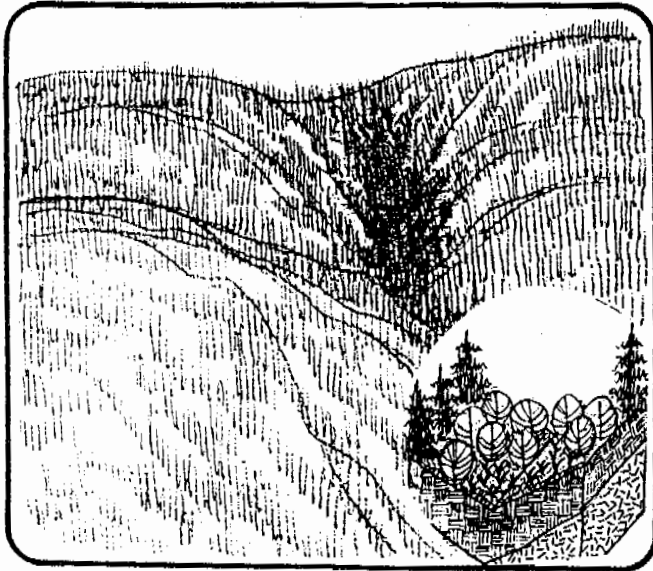
POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate in potential for summer habitat, and low for winter habitat due to inaccessibility.



II - 203

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LANDTYPE 36-U92



SUMMARY

Number of map delineations - 448
Total acreage - 20,600
Average map unit acreage - 46

These units are located on high elevation, concave uplands. Soils are well drained on ridges, poorly drained in concave areas, and have deep profiles developed in undifferentiated parent material. The habitat type is subalpine fir/pachistima with riparian vegetation in wet concave areas.

LANDFORM 36-HIGH ELEVATION CONCAVE HEADLANDS

Overall relief consists of small concave inverted teardrop-shaped landforms which occur at high elevations in association with broad convex landforms. These landforms act as concave catch basins.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 5,000 to 7,000 feet
- B. Slope Gradient - 30 to 60%
- C. Slope Shape - Concave both vertically and laterally. Surface topography is hummocky and may be stair-stepped
- D. Overall Relief - 200 to 750 feet
- E. Dissection Relief - 5 to 20 feet
- F. Dissection Density - 5 to 10 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Seeps, bogs, stream heads, poorly developed streams.

STREAM DENSITY: 1-7 miles/mile²
MEAN: 4.00 miles/mile²

PRIMARY STREAM ORDER: 1 (100%)

CHANNEL TYPE: Poorly developed, usually associated with seeps or bogs.

SLOPE WATER MOVEMENT: These are areas of subsurface water concentration. High water occurs in central and lower portions of the unit for most of the year. A single stream usually originates in the unit.

SEDIMENT DELIVERY: Low.

PARENT MATERIAL GROUP

This group includes material from the Belt quartzites, the Idaho Batholith granitics, and mixed glacial tills.



SOIL-VEGETATIVE UNIT

This unit occurs at elevations above 5,000 feet on all aspect slopes. Soil profiles are 60+ inches deep. Well drained ridge soils have a volcanic ash surface 7 to 17 inches thick. Poorly drained concave depression soils have a darkened, modified volcanic ash surface 6 to 18 inches thick. Subsurface soil is coarse textured with 20 to 60% rock fragments. Naturally dense fragipan layers may occur in concave areas resulting in perched water.

TYPICAL SOIL PROFILES

(Well drained soil)

Surface Soil - 0 to 12" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 7 to 17" thick).

Subsoil - 14 to 36" brown gravelly sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 30 to 40% rock fragments, (range 20 to 30" thick).

Substratum - 36 to 60"+ light brown gravelly sandy loam, structureless, nonsticky, nonplastic, 30 to 50% rock fragments.

(Poorly drained soil)

Surface Soil - 0 to 14" very dark brown silt loam with weak subangular blocky structure, nonsticky, nonplastic, (range 6 to 18" thick).

Subsoil - 14 to 30" dark greyish brown gravelly sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 20 to 60% rock fragments, (range 15 to 30" thick).*

Substratum - 30 to 60"+ pale brown gravelly sandy loam, structureless, nonsticky, nonplastic, 20 to 60% rock fragments.*

*NOTE: These horizons may have a naturally dense (fragipan) layer which can cause perching of water and poor drainage.

SOIL CLASSIFICATION - Andic Cryochrepts, loamy-skeletal, mixed, and Typic Cryumbrepts, loamy-skeletal, mixed.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS -

VEGETATIVE CHARACTERISTICS - The dominant habitat type on well drained sites is subalpine fir/pachistima (ABLA/PAMY) with shallow areas at subalpine fir/menziesia (ABLA/MEFE) and beargrass (ABLA/XETE). Poorly drained depressions have alder, fern, and sedge vegetation.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a high mass failure potential. Other ratings are low to moderate.

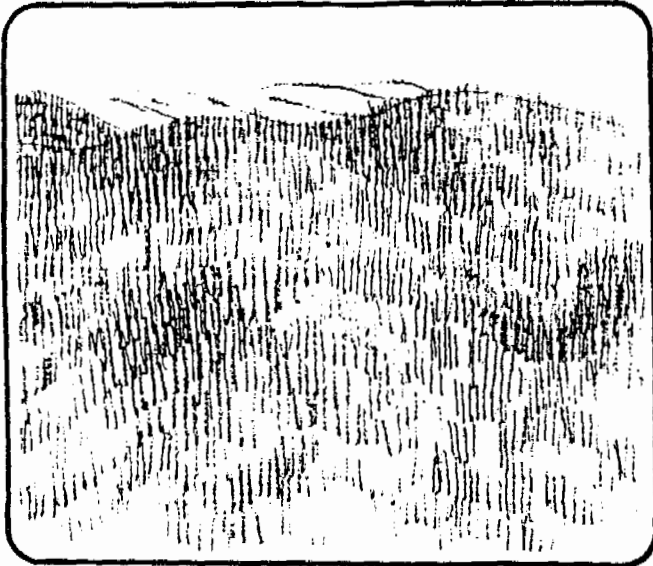
ENGINEERING - Potential road construction problems are associated with wet areas and include a high mass failure hazard and a moderate risk of sediment delivery to streams. Cutbank sloughing, rapid brush encroachment and tread wear in rocky road surfaces require maintenance.

SILVICULTURE - Silvicultural limitations are related to high water tables, severe brush competition, and dark colored umbric soils, all of which occur in wet areas. The windthrow hazard potential is high.

POTENTIAL WILDLIFE HABITAT - This landtype has properties such as food, water, cover, and vegetative diversity which are important components of wildlife habitat. Because of the high elevation, this landtype is inaccessible in the winter and has high potential primarily as summer range.



LANDTYPE 38-L66



SUMMARY

Number of map delineations - 74
Total acreage - 10,800
Average map unit acreage - 142

These units are located on high elevation, cool aspect rolling uplands. Soils are deep, well drained, and are developed in glacial till parent material. The habitat type is subalpine fir/menziesia.

LANDFORM 38-HIGH ELEVATION SCoured UPLANDS

Overall relief consists of rolling, undulating uplands with ice modified dendritic drainage systems. Glacial tills occur in draws and depressions.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Ranges - 5,000 to 6,500 feet
- B. Slope Gradients - 10 to 30%
- C. Slope Shape - Convex ridgetops and upper sideslopes with compound lower sideslopes and draws
- D. Overall Relief - 100 to 400 feet
- E. Dissection Spacing - 300 to 750 feet
- F. Dissection Relief - 50 to 100 feet
- G. Dissection Density - 5 to 10 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: None.

STREAM DENSITY: 0-2 miles/mile²
MEAN: 0.50 miles/mile²

PRIMARY STREAM ORDER: 1-2 (90%)

CHANNEL TYPE: Weakly incised rectangular channels in unconsolidated glacial tills; stable.

SLOPE WATER MOVEMENT: Water movement is entirely subsurface.

SEDIMENT DELIVERY: Very low, storage on slopes is high.

PARENT MATERIAL GROUP

This group includes glacial till from various bedrock types and reflects the lithology of the local drainage.



SOIL-VEGETATIVE UNIT

This unit occurs at elevations above 5,000 feet on low energy slopes. Soil profiles are 60+ inches deep. Surface soil is volcanic ash 9 to 20 inches thick. Subsurface soil is coarse textured with 20 to 60% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 14" very dark brown and dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 9 to 20" thick).

Subsoil - 14 to 32" brown gravelly sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 20 to 60% rock fragments, (range 7 to 28" thick).

Substratum - 32 to 60"+ pale brown gravelly sandy loam, structureless, nonsticky, nonplastic, 30 to 60% rock fragments.

SOIL CLASSIFICATION - Entic Cryandepts, medial/loamy-skeletal, mixed, and Andic Cryochrepts, Toamy-skeletal, mixed.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Umbric soils with dark colored surface horizons are common inclusions. Residual soils occur on scoured knolls and occupy up to 40% of the unit.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is subalpine fir/menziesia (ABLA/MEFE) with subalpine fir/heargrass (ABLA/XETE) occurring on scoured knolls and ridges.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect low potential hazard ratings.

ENGINEERING - This landtype has no significant road construction problems. Rapid brush encroachment and tread wear in bouldery road surfaces are maintenance problems.

SILVICULTURE - The major regeneration limitation for this landtype is severe brush competition. Overstory removal may result in frost pocket formation.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate in potential for summer habitat and low for winter habitat due to inaccessibility.



LANDTYPE 38-L91



SUMMARY

Number of map delineations - 33
Total acreage - 3,100
Average map unit acreage - 94

These units are located on high elevation rolling uplands. Soils are well drained on ridges, poorly drained in glacial depression areas, and have moderately deep profiles developed in glacial till parent material. The habitat type is subalpine fir/pachistima with riparian vegetation in wet depression areas.

LANDFORM 38-HIGH ELEVATION SCoured UPLANDS

Overall relief consists of rolling, undulating uplands with ice modified dendritic drainage systems. Glacial tills occur in draws and depressions.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Ranges - 4,800 to 6,500 feet
- B. Slope Gradients - 10 to 30%
- C. Slope Shape - Convex ridgetops and upper sideslopes with compound lower sideslopes and draws
- D. Overall Relief - 100 to 400 feet
- E. Dissection Spacing - 300 to 750 feet
- F. Dissection Relief - 50 to 100 feet
- G. Dissection Density - 5 to 10 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: None.

STREAM DENSITY: 0-2 miles/mile²
MEAN: 0.50 miles/mile²

PRIMARY STREAM ORDER: 1-2 (90%)

CHANNEL TYPE: Weakly incised rectangular channels in unconsolidated glacial tills; stable.

SLOPE WATER MOVEMENT: Water movement is entirely subsurface.

SEDIMENT DELIVERY: Very low, storage on slopes is high.

PARENT MATERIAL GROUP

This group includes glacial tills from various bedrock groups and reflects the lithology of the local drainage.



SOIL-VEGETATIVE UNIT

This unit occurs at elevations above 4,800 feet on all aspect slopes. Soil profiles are 20 to 48 inches deep. Well drained ridge soils have a volcanic ash surface 5 to 20 inches thick. Poorly drained glacial scoured depression soils have a darkened, modified volcanic ash surface 10 to 20 inches thick. Subsurface soil is coarse textured with 20 to 60% rock fragments.

TYPICAL SOIL PROFILES

(Well drained soil)

Surface Soil - 0 to 10" dark brown silt loam, weak granular structure, nonsticky, nonplastic, 0 to 20% rock fragments (range 5 to 20" thick).

Subsoil/Substratum - 10 to 48"+ pale brown gravelly sandy loam, weak subangular blocky to massive, nonsticky, nonplastic, 30 to 60% rock fragments.

(Poorly drained soil)

Surface Soil - 0 to 16" very dark, grayish brown silt loam, weak granular structure, nonsticky to slightly sticky, 0 to 20% rock fragments (range 10 to 20" thick).

Subsoil - 16 to 48" grayish brown to gray (gleyed) gravelly sandy loam silt loam, subangular blocky structure, 20 to 50% rock fragments (range 30 to 40" thick).

Substratum - 60"+ light gray gravelly sandy loam, massive, 30 to 60% rock fragments.

SOIL CLASSIFICATION - Andic Cryochrepts, loamy-skeletal, mixed, and Andic Cryumbrepts, loamy-skeletal, mixed.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Poorly drained soils occur in draws and depressions. Wetness is usually the result of topographic position rather than permeable layers, however, fragipans can occur. Residual soils occupy up to 40% of the unit and can occur on scoured knolls.

VEGETATIVE CHARACTERISTICS - The dominant habitat types on well drained sites are subalpine fir/pachistima (ABLA/PAMY) and menziesia (ABLA/MEFE), with beargrass (ABLA/XETE) on drier ridges. Poorly drained areas have alder, fern, and sedges.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect low potential hazard ratings.

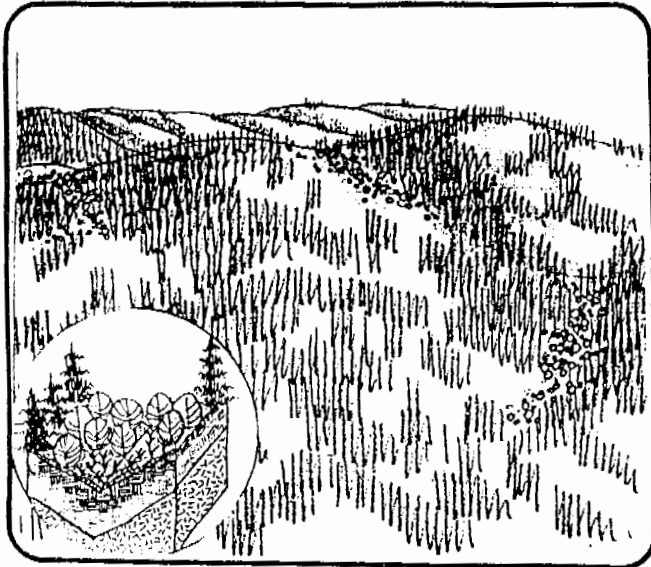
ENGINEERING - Potential road construction problems are those associated with wet areas. Rapid brush encroachment, cutbank sloughing, and treadwear in bouldery road surfaces are maintenance problems.

SILVICULTURE - Silvicultural limitations are related to high water tables, severe brush competition, umbric soil surfaces, and high surface rock fragment contents. Overstory removal may result in frost pocket formation. Windthrow hazard is rated high.

POTENTIAL WILDLIFE HABITAT - This landtype has properties such as food, water, cover, and vegetative diversity which are important components of wildlife habitat. Because of the high elevation, this landtype is inaccessible in the winter and has high potential only as summer range.



LANDTYPE 38-L93



SUMMARY

Number of map delineations - 53
Total acreage - 13,900
Average map unit acreage - 262

These units are located on high elevation, rolling uplands. Soils are well drained on ridges, poorly drained on compacted till areas, and have deep profiles developed in glacial till parent material. The habitat type is subalpine fir/pachistima with forb and grass vegetation.

LANDFORM 38-HIGH ELEVATION SCoured UPLANDS

Overall relief consists of rolling, undulating uplands with ice modified dendritic drainage systems. Glacial tills occur in draws and depressions.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Ranges - 4,800 to 6,500 feet
- B. Slope Gradients - 10 to 30%
- C. Slope Shape - Convex ridgetops and upper sideslopes with compound lower sideslopes and draws
- D. Overall Relief - 100 to 400 feet
- E. Dissection Spacing - 300 to 750 feet
- F. Dissection Relief - 50 to 100 feet
- G. Dissection Density - 5 to 10 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: None.

STREAM DENSITY: 0-2 miles/mile²
MEAN: 0.50 miles/mile²

PRIMARY STREAM ORDER: 1-2 (90%)

CHANNEL TYPE: Weakly incised rectangular channels in unconsolidated glacial tills; stable.

SLOPE WATER MOVEMENT: Water movement is entirely subsurface.

SEDIMENT DELIVERY: Very low, storage on slopes is high.

PARENT MATERIAL GROUP

This group includes glacial till from various bedrock groups and reflects the lithology of the local drainage.



SOIL-VEGETATIVE UNIT

This unit occurs at elevations above 4,800 feet on all aspect slopes. Soil profiles are 20 to 48 inches deep. Well drained soils have a volcanic ash surface 7 to 13 inches thick. Poorly drained compacted till soils have a darkened, modified volcanic ash surface 3 to 11 inches thick. Subsurface soil is coarse textured with 30 to 60% rock fragments. Naturally dense fragipan layers may occur in wet compact till areas.

TYPICAL SOIL PROFILES

(Moderately well drained soil)

Surface Soil - 0 to 10" very dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 7 to 13" thick).

Subsoil - 10 to 21" dark brown gravelly sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 40 to 60% rock fragments, (range 7 to 20" thick).

Substratum - 21 to 60"+ pale brown gravelly sandy loam, structureless, nonsticky, nonplastic, 40 to 60% rock fragments.

(Poorly drained soil)

Surface Soil - 0 to 8" very dark brown silt loam with weak subangular blocky structure, nonsticky, nonplastic, (range 3 to 11" thick).

Subsoil - 8 to 20" dark greyish brown gravelly sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 30 to 60% rock fragments, (range 10 to 20" thick).*

Substratum - 20 to 60"+ pale brown gravelly sandy loam, structureless, nonsticky, nonplastic, 30 to 60% rock fragments.*

*NOTE: These horizons have a naturally dense (fragipan) layer which can perch water and result in poor drainage and perched water tables.

SOIL CLASSIFICATION - Andic Cryochrepts, loamy-skeletal, mixed, and Andic Fragiumbrepts, loamy-skeletal, mixed, cryic.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Depth to the compacted layer varies from 2 to 6 feet. If greater than 6 feet, it does not appear to affect the surface water table formation.

VEGETATIVE CHARACTERISTICS - The dominant habitat types in well drained areas are subalpine fir/pachistima (ABLA/PAMY) and beargrass (ABLA/XETE). Poorly drained soils support ferns, forbs, and grasses.

MANAGEMENT CONSIDERATIONS

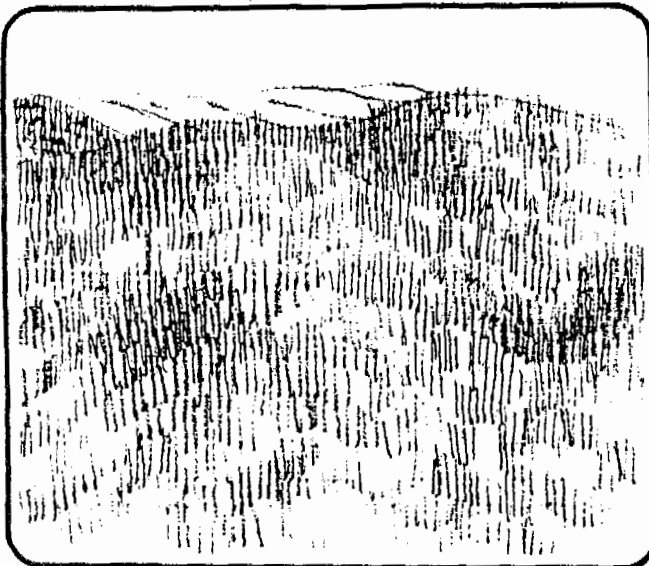
WATERSHED - Watershed interpretations reflect high surface, subsoil, and parent material erosion potentials, with a low erosion delivery efficiency. From a watershed standpoint, this is an extremely sensitive landtype. Severe damage will result from surface erosion, concentration of runoff and the raising of water tables through vegetative removal. Tractor skidding over snow or line skidding is required to prevent severe surface erosion.

ENGINEERING - Potential road construction problems are associated with wet, compacted tills and include a high rate of erosion from the excavated road prism along with a low risk of sediment being delivered to streams. Road drainage systems must handle unusually large volumes of runoff. Cutbank sloughing, rapid brush encroachment, and treadwear in rocky road surfaces require maintenance.

SILVICULTURE - Silvicultural limitations are related to high water tables, severe brush competition, and dark colored umbric soils. A major problem is the tendency of water tables to rise with vegetation removal. For this reason, cutting units should be limited to 10 acres or less.

POTENTIAL WILDLIFE HABITAT - This landtype has properties such as food, water, cover, and vegetative diversity which are important components of wildlife habitat. Because of the high elevation, this landtype is inaccessible in the winter and has high potential only as summer range.

LANDTYPE 38-U80



SUMMARY

Number of map delineations - 85
Total acreage - 8,600
Average map unit acreage - 101

These units are located on high elevation, rolling uplands. Soils are shallow to moderately deep, excessively drained and are developed in undifferentiated parent material. The habitat type is subalpine fir/beargrass.

LANDFORM 38-HIGH ELEVATION SCoured UPLANDS

Overall relief consists of rolling, undulating uplands with ice modified dendritic drainage systems. Glacial tills occur in draws and depressions.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Ranges - 5,000 to 6,500 feet
- B. Slope Gradients - 10 to 30%
- C. Slope Shape - Convex ridgetops and upper sideslopes with compound lower sideslopes and draws
- D. Overall Relief - 100 to 400 feet
- E. Dissection Spacing - 300 to 750 feet
- F. Dissection Relief - 50 to 100 feet
- G. Dissection Density - 5 to 10 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: None.

STREAM DENSITY: 0-2 miles/mile²
MEAN: 0.50 miles/mile²

PRIMARY STREAM ORDER: 1-2 (90%)

CHANNEL TYPE: Weakly incised rectangular channels in unconsolidated glacial tills; stable.

SLOPE WATER MOVEMENT: Water movement is entirely subsurface.

SEDIMENT DELIVERY: Very low, storage on slopes is high.

PARENT MATERIAL GROUP

This group includes weakly weathered undifferentiated bedrock. Lithologic type does not influence basic interpretative criteria for the unit.



SOIL-VEGETATIVE UNIT

This unit occurs at elevations above 5,000 feet on all aspect slopes. Soil profiles are 16 to 48 inches deep and are droughty. Surface soil has a volcanic ash surface 6 to 17 inches thick. Subsurface soil is coarse textured with 40 to 60% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 11" brown silt loam with weak granular structure, nonsticky, nonplastic, (range 6 to 17" thick).

Subsoil - 12 to 30" pale brown gravelly sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 20 to 60% rock fragments, (8 to 36" thick).

Substratum - 30 to 48"+ light yellowish brown very gravelly sandy loam, structureless, nonsticky, nonplastic, 35 to 60% rock fragments.

SOIL CLASSIFICATION - Andic Cryochrepts, loamy-skeletal, mixed, and Typic Cryochrepts, Toamy-skeletal, mixed.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Some units have mixed ash caps with sandy loam textures and may contain up to 20% rock fragments. Small, poorly drained depression areas occupy less than 15% of the area. A thin dark colored A1 horizon (2 to 5") is common in areas that have not been subjected to surface erosion.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is subalpine fir/beargrass (ABLA/XETE) with subalpine fir/menziesia on cooler, moist aspects.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a high surface soil erosion potential. This landtype is especially susceptible to surface erosion when vegetation is completely removed as occurs in severely burned areas. Other ratings are low to moderate.

ENGINEERING - This unit has no significant road construction or maintenance problems.

SILVICULTURE - The volcanic ash is critical to the productivity of this landtype and heavy equipment operations should avoid removal or displacement of this surface layer. Ash removal results in a significant reduction in moisture holding and nutrient supplying capacity. The maintenance of woody material for replenishment of soil organic matter appears to be critical on these sites. With the ash surface soil intact, there are no major silvicultural limitations on this landtype. Prescribed burning guides recommend low intensity fires to avoid excessive soil temperatures and resulting potential erosion.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate in potential for summer habitat, and low for winter habitat because of inaccessibility.



LANDTYPE 41-L91



SUMMARY

Number of map delineations - 104
Total acreage - 7,300
Average map unit acreage - 70

These units are located in high elevation, moderate to strongly scoured cirque basins. Soils are well to excessively well drained on ridges, poorly drained in scoured depressions and have shallow to moderately deep profiles developed in glacial till. The habitat type is subalpine fir/beargrass with grass and forbs in wet areas. Rock outcrop comprises 25 to 75% of this unit.

LANDFORM 41-STRONGLY SCoured CIRQUE BASINS, HEADWALLS

Overall relief consists of glacial scoured cirque basins and associated headwalls which have from 25 to 75%+ rock outcrop. Glacial till occurs on the remainder of the landscape, varying in size and thickness. Timber is sparse and patchy.

PHYSICAL LANDFORM CHARACTERISTICS

- A. Elevation Range - 5,000 to 8,000 feet
- B. Slope Gradient - Predominantly 50%+ with gentler slopes occurring in the basin floors
- C. Slope Shape - Normally concave both laterally and vertically
- D. Overall Relief - 500 to 2,500 feet

SLOPE HYDROLOGY

DRAINAGE PATTERN: None.

STREAM DENSITY: 1-3 miles/mile²
MEAN: 2.00 miles/mile²

PRIMARY STREAM ORDER: 1 (100%)

CHANNEL TYPE: Bedrock, only incisions are into moss or duff.

SLOPE WATER MOVEMENT: Entirely surface or litter flow. Very rapid on scoured portions of unit. Till pockets store large volumes of subsurface water and release well regulated late season flows.

SEDIMENT DELIVERY: Very high.

OTHER IMPORTANT CHARACTERISTICS: Avalanche and snow slides are frequent.

PARENT MATERIAL GROUP

This group includes alpine glacial till from various bedrock groups, and reflects the lithology of the local drainage. Rock outcrop comprises 25 to 75% of this unit.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations above 5,000 feet on all aspect slopes. Soil profiles are 10 to 48 inches deep. Well to excessively drained till soils have a volcanic ash surface 3 to 10 inches thick. Poorly drained scoured depressions have a darkened, modified volcanic ash surface 3 to 9 inches thick. Subsurface soil is coarse textured with 30 to 70% rock fragments.

TYPICAL SOIL PROFILE

(Well drained soil)

Surface Soil - 0 to 7" dark brown gravelly silt loam with weak granular structure, nonsticky, nonplastic, 10 to 20% rock fragments (range 3 to 10" thick).

Subsoil - 7 to 19" brown gravelly sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 30 to 60% rock fragments (range 9 to 25" thick).

Substratum - 19 to 30" pale brown very gravelly sandy loam, structureless, nonsticky, nonplastic, 35 to 70% rock fragments.

(Poorly drained soil)

Surface Soil - 0 to 7" very dark brown silt loam with weak granular structure, nonsticky, nonplastic (range 3 to 9" thick).

Subsoil - 7 to 20" dark greyish brown gravelly sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 30 to 60% rock fragments (range 10 to 20" thick).*

Substratum - 20 to 48" pale brown gravelly sandy loam structureless, nonsticky, nonplastic, 30 to 60% rock fragments.*

*NOTE: Water tables may occur in these horizons due to shallow bedrock or topographic position.

SOIL CLASSIFICATION - Rockland - Cryochrepts.

SOIL DISTRIBUTION, VARIATION, AND INCLUSIONS - Soils are highly variable over the unit. Scoured portions of the unit have soils of variable depth occurring as pockets. Cirque basin floors have deep, poorly drained profiles of organic soils.

VEGETATIVE CHARACTERISTICS - The dominant habitat type on well to excessively drained sites is subalpine fir/beargrass (ABLA/XETE) with poorly drained areas having subalpine fir, grass, and forbs.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect very high surface erosion and sediment delivery efficiency. Other ratings are low to moderate.

ENGINEERING - Potential road construction problems are associated with wet areas in cirque bottoms rock outcrop in headwalls. Snow avalanches are common.

SILVICULTURE - This landtype is noncommercial Forest land.

POTENTIAL WILDLIFE HABITAT - This landtype has properties such as food, water, cover and vegetative diversity which are important components of wildlife habitat. Because of the high elevation, this landtype is inaccessible in the winter and has high potential only as summer range.



LANDTYPE 42-L66



SUMMARY

Number of map delineations - 32
Total acreage - 4,900
Average map unit acreage - 152

These units are located in high elevation, cool aspect, weakly scoured cirque basins. Soils are deep, well drained and are developed in glacial till parent material. The habitat type is subalpine fir/menziesia. Rock outcrop comprises up to 25% of this unit.

LANDFORM 42-WEAKLY SCOURED CIRQUE BASINS, HEADWALLS

Overall relief consists of glacial scoured cirque basins and associated headwalls which have less than 25% rock outcrop. Glacial tills of varying depth and drainage class occupy the remainder of this unit. Timber cover is normally continuous.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 5,000 to 6,000 feet
- B. Slope Gradient - 40 to 60% with gentler gradients in small basin floor areas.
- C. Slope Shape - Concave both vertically and laterally
- D. Overall Relief - 200 to 1,000 feet
- E. Dissection Spacing - Variable with some weakly incised first order streams.

SLOPE HYDROLOGY

DRAINAGE PATTERN: None

STREAM DENSITY: 0-5 miles/mile²
MEAN: 1.75 miles/mile²

PRIMARY STREAM ORDER: 1 (100%)

CHANNEL TYPE: Developed in tills with some bedrock. Rectangular shaped channels with unconsolidated banks.

SLOPE WATER MOVEMENT: Totally surface flow on headwalls to seasonally subsurface in the bottoms with high storage capacity.

SEDIMENT DELIVERY: Very high, low storage capacity.

OTHER IMPORTANT CHARACTERISTICS: Basins may contain a lake, stream head, or till accumulations with very high water storage capacity. Cirques can yield large volumes of water throughout the year as generally regulated flow.

PARENT MATERIAL GROUP

This group includes glacial till from various bedrock types and reflects the lithology of the local drainage.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations above 5,000 feet on low energy slopes. Soil profiles are 60+ inches deep. Surface soil is volcanic ash 9 to 19 inches thick. Subsurface soil is coarse textured with 20 to 60% rock fragments. Large ice deposited boulders are common on the surface.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 13" dark brown silt loam with weak granular structure, nonsticky, nonplastic (range 9 to 19" thick).

Subsoil - 13 to 38" brown gravelly sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 20 to 55% rock fragments (range 10 to 30" thick).

Substratum - 38 to 60"+ pale brown gravelly loamy sand, structureless, nonsticky, nonplastic, 25 to 60% rock fragments.

SOIL CLASSIFICATION - Andic Cryochrepts, loamy-skeletal, mixed, and Typic Cryochrepts, loamy-skeletal, mixed.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Shallow droughty soils that can be either residual or mixed fills occur on scoured cirque walls. Two to five-inch A1 horizons are common to the unit.

VEGETATIVE CHARACTERISTICS - The dominant habitat types are subalpine fir/menziesia (ABLA/MEFE) and subalpine fir/beargrass (ABLA/XETE). Smaller areas with subalpine fir/pachistima (ABLA/PAMY) occur at lower elevations.

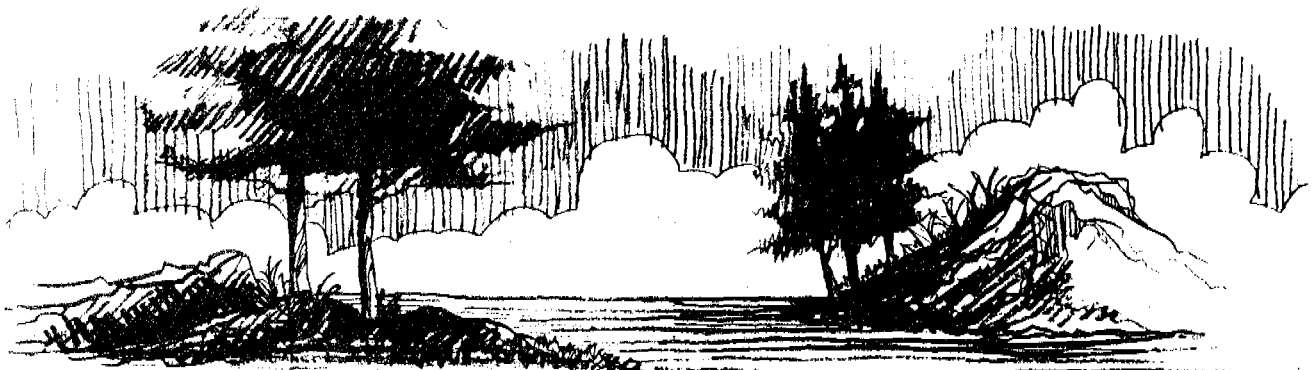
MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect low to moderate hazard ratings.

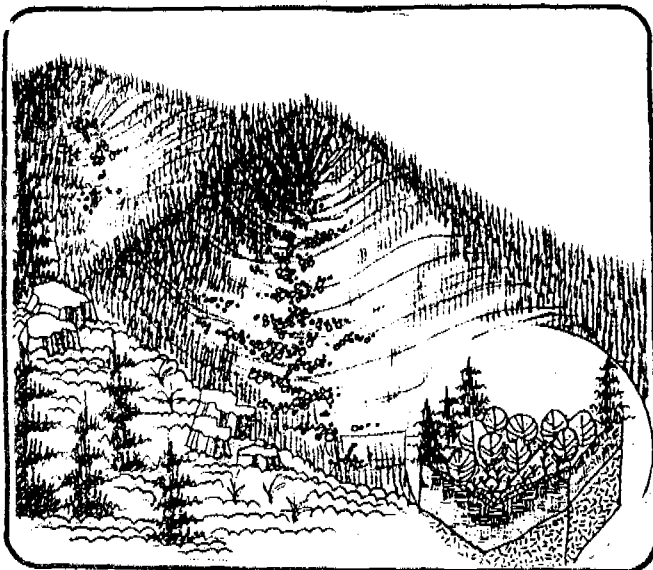
ENGINEERING - No significant road construction problems are associated with this unit. Rapid brush encroachment and treadwear on rocky road surfaces are maintenance problems.

SILVICULTURE - Silvicultural limitations are severe brush competition.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate for potential summer habitat. The winter habitat rating is low because of inaccessibility caused by snow accumulation.



LANDTYPE 42-L91



SUMMARY

Number of map delineations - 111
Total acreage - 8,100
Average map unit acreage - 73

These units are located in high elevation, weakly scoured cirque basins. Soils are well drained on ridges, poorly drained in scoured depressions, and have shallow to moderately deep to deep profiles developed in glacial till. The habitat type is subalpine fir/beargrass with grass and shrub vegetation in wet areas. Rock outcrop comprises 10 to 25% of this unit.

LANDFORM 42-WEAKLY SCoured CIRQUE BASINS, HEADWALLS

Overall relief consists of glacial scoured cirque basins and associated headwalls which have less than 25% rock outcrop. Glacial tills of varying depth and drainage class occupy the remainder of this unit. Timber cover is normally continuous.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 5,000 to 6,000 feet
- B. Slope Gradient - 40 to 60% with gentler gradients in small basin floor areas.
- C. Slope Shape - Concave both vertically and laterally
- D. Overall Relief - 200 to 1,000 feet
- E. Dissection Spacing - Variable with some weakly incised first order streams.

SLOPE HYDROLOGY

DRAINAGE PATTERN: None

STREAM DENSITY: 0-5 miles/mile²
MEAN: 1.75 miles/mile²

PRIMARY STREAM ORDER: 1 (100%)

CHANNEL TYPE: Developed in tills with some bedrock. Rectangular shaped channels with unconsolidated banks.

SLOPE WATER MOVEMENT: Totally surface flow on headwalls to seasonally subsurface in the bottoms with high storage capacity.

SEDIMENT DELIVERY: Very high, low storage capacity.

OTHER IMPORTANT CHARACTERISTICS: Basins may contain a lake, stream head, or till accumulations with very high water storage capacity. Cirques can yield large volumes of water throughout the year as generally regulated flow.

PARENT MATERIAL GROUP

This group includes alpine glacial till from various bedrock groups and reflects the lithology of the local drainage. Rock outcrop comprises 10 to 25% of this unit.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations above 5,000 feet on all aspect slopes. Soil profiles are 10 to 60 inches deep. Well drained till soils have a volcanic ash surface 7 to 16 inches thick. Poorly drained scoured depressions have a darkened, modified volcanic ash surface 3 to 11 inches thick. Subsurface soil is coarse textured with 30 to 60% rock fragments. Large, ice deposited boulders are common on the surface.

TYPICAL SOIL PROFILES

(Well drained soil)

Surface Soil - 0 to 10" dark brown silt loam with weak granular structure, nonsticky, nonplastic, 5 to 10% rock fragments, (range 7 to 16" thick).

Subsoil - 10 to 24" brown gravelly sandy loam with weak subangular blocky structure, nonsticky nonplastic, 30 to 60% rock fragments, (range 10 to 30" thick).

Substratum - 24 to 60"+ pale brown very gravelly sandy loam, structureless, nonsticky, nonplastic, 35 to 70% rock fragments.

(Poorly drained soil)

Surface Soil - 0 to 7" very dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 3 to 11" thick).

Subsoil - 7 to 20" dark greyish brown gravelly sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 30 to 60% rock fragments, (range 10 to 20" thick).*

Substratum - 20 to 60"+ pale brown gravelly sandy loam structureless, nonsticky, nonplastic, 30 to 60% rock fragments.*

*NOTE: Water tables may occur in these horizons due to shallow bedrock and topographic position.

SOIL CLASSIFICATION - Andic Cryochrepts/Aquic Cryumbrepts complex.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Soils are highly variable over the unit. Scoured portions of the unit have soils of variable depth occurring as pockets. Deep soils which may be poorly drained and even organic soils occur on cirque basin floors.

VEGETATIVE CHARACTERISTICS - The dominant habitat types on well drained sites are subalpine fir/menziesia (ABLA/MEFE) and subalpine fir/pachistima (ABLA/PAMY). Poorly drained areas have alder, ferns, and sedge vegetation.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect low to moderate hazard ratings.

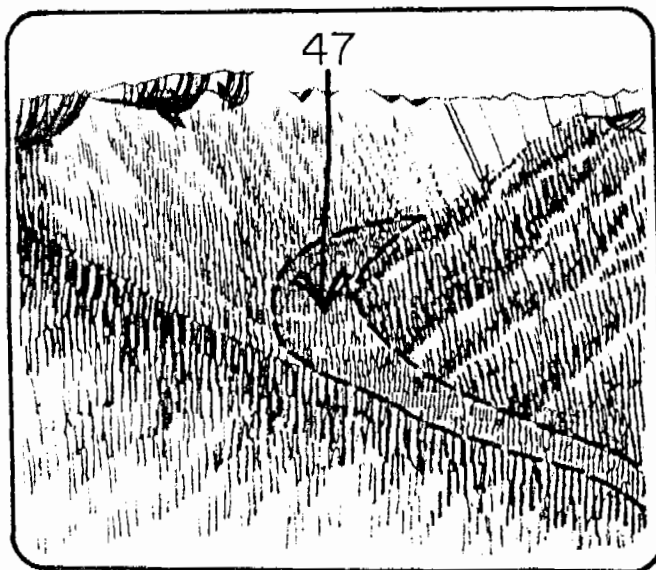
ENGINEERING - Potential road construction problems are associated with wet areas. Rapid brush encroachment and treadwear on rocky road surfaces are maintenance problems.

SILVICULTURE - Silvicultural limitations are related to rapid brush encroachment, high water tables, and dark colored umbric soils, all of which occur in wet areas. Soil compaction and windthrow hazards are rated high in wet areas.

POTENTIAL WILDLIFE HABITAT - This landtype has properties such as food, water, cover, and vegetation diversity which are important components of wildlife habitat. Because of the high elevation, this landtype is inaccessible in the winter and has high potential as summer range.



LANDTYPE 47-L66



SUMMARY

Number of map delineations - 50
Total acreage - 8,100
Average map unit acreage - 162

These units are located in high elevation, cool aspect, glacial trough bottoms. Soils are deep, well drained, and are developed in glacial till parent material. The habitat type is subalpine fir/menziesia with pachistima occurring at lower elevations.

LANDFORM 47-GLACIAL TROUGH BOTTOMS

Overall relief consists of flat to slightly concave glacial trough bottoms. This landform contains depositional material laid down by glacial ice and meltwaters.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 5,000 to 6,500 feet
- B. Slope Gradient - Generally less than 15% but may be up to 40% for short reaches
- C. Slope Shape - Flat to slightly concave valley bottoms
- D. Overall Relief - 0 to 50 feet
- E. Dissection Spacing - Contains one weakly incised stream running the length of the unit with side streams entering from surrounding landforms.

SLOPE HYDROLOGY

DRAINAGE PATTERN: Controlled by adjacent landforms.

STREAM DENSITY: 4-12 miles/mile²
MEAN: 6.25 miles/mile²

PRIMARY STREAM ORDER: 3-4 (50%)

CHANNEL TYPE: Depositional, often glacial outwash material; sometimes braided, energy limited; often unstable with overflow channels.

SLOPE WATER MOVEMENT: Subsurface flow dominates most of year, seasonally high runoff in small tributaries.

SEDIMENT DELIVERY: Moderate with high storage capacities.

OTHER IMPORTANT CHARACTERISTICS: Landform is entirely depositional - tills or glacial-fluvial outwash material. Ponds, lakes, and wetlands are common. A large master stream usually flows longitudinally through the unit. Unit is often a floodplain.

PARENT MATERIAL GROUP

This group includes glacial till from various bedrock groups and reflects the lithology of the local drainage.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations above 5,000 feet on low energy slopes. Soil profiles are 60+ inches deep. Surface soil is volcanic ash 9 to 18 inches thick. Subsurface soil is coarse textured with 20 to 60% rock fragments. Large ice deposited boulders are common on the surface.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 13" dark brown silt loam with weak granular structure, nonsticky, nonplastic (range 9 to 18" thick).

Subsoil - 13 to 38" brown gravelly sandy loam with weak subangular blocky structure, nonsticky nonplastic, 20 to 55% rock fragments (range 10 to 30" thick).

Substratum - 38 to 60"+ pale brown gravelly loamy sand, structureless, nonsticky, nonplastic, 25 to 60% rock fragments.

SOIL CLASSIFICATION - Andic Cryochrepts, loamy-skeletal, mixed, and Typic Cryandeps, medial/loamy-skeletal, mixed.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Shallow droughty soils that can be either residual or mixed tills occur on scoured knolls and points. Poorly drained tills occupy <15% of the unit. Soils with dark colored surface horizons (Cryumbrepts) are common inclusions.

VEGETATIVE CHARACTERISTICS - The dominant habitat types are subalpine fir/menziesia (ABLA/MEFE). Lower elevations may have subalpine fir/pachistima (ABLA/PAMY). Subalpine fir/beargrass (ABLA/XETE) occurs on bouldery, well drained inclusions.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect low potential hazard ratings.

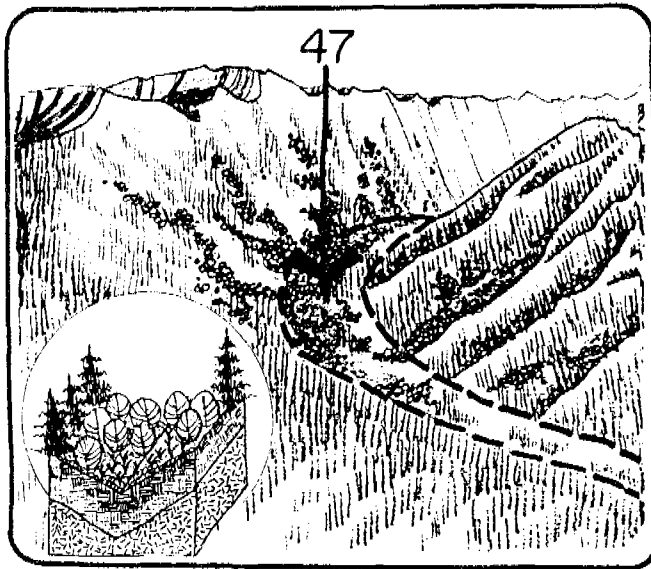
ENGINEERING - No significant road construction problems are associated with this unit. Rapid brush encroachment and treadwear on rocky road surfaces are maintenance problems.

SILVICULTURE - Silvicultural limitations are related to soils having large percentages of surface rock fragments. Overstory removal may result in frost pocket formation.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate for potential summer habitat. The winter habitat rating is low because of inaccessibility caused by snow accumulations.



LANDTYPE 47-L91



SUMMARY

Number of map delineations - 98
Total acreage - 19,800
Average map unit acreage - 202

These units are located on high elevation, glacial trough bottoms. Soils are well drained on ridges, poorly drained in glacial depression areas and are developed in glacial till parent material. The habitat type is subalpine fir/menziesia with riparian vegetation in wet depression areas.

LANDFORM 47-GLACIAL TROUGH BOTTOMS

Overall relief consists of flat to slightly concave glacial trough bottoms. This landform contains depositional material laid down by glacial ice and meltwaters.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 4,800 to 6,500 feet
- B. Slope Gradient - Generally less than 15% but may be up to 40% for short reaches
- C. Slope Shape - Flat to slightly concave valley bottoms
- D. Overall Relief - 0 to 50 feet
- E. Dissection Spacing - Contains one weakly incised stream running the length of the unit with side streams entering from surrounding landforms.

SLOPE HYDROLOGY

DRAINAGE PATTERN: Controlled by adjacent landforms.

STREAM DENSITY: 4-12 miles/mile²
MEAN: 6.25 miles/mile²

PRIMARY STREAM ORDER: 3-4 (50%)

CHANNEL TYPE: Depositional, often glacial outwash material; sometimes braided, energy limited; often unstable with overflow channels.

SLOPE WATER MOVEMENT: Subsurface flow dominates most of year, seasonally high runoff in small tributaries.

SEDIMENT DELIVERY: Moderate with high storage capacities.

OTHER IMPORTANT CHARACTERISTICS: Landform is entirely depositional - tills or glacial-fluvial outwash material. Ponds, lakes, and wetlands are common. A large master stream usually flows longitudinally through the unit. Unit is often a floodplain.

PARENT MATERIAL GROUP

This group includes glacial till from various bedrock groups and reflects the lithology of the local drainage.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations above 4,800 feet on all aspect slopes. Soil profiles are 60+ inches deep. Well drained ridge soils have a volcanic ash surface 5 to 15 inches thick. Poorly drained glacial scoured depression soils have a darkened, modified volcanic ash surface 10 to 20 inches thick. Subsurface soil is coarse textured with 20 to 60% rock fragments. Large ice deposited boulders are common on the surface.

TYPICAL SOIL PROFILES

(Well drained soil)

Surface Soil - 0 to 10" dark brown silt loam, weak granular structure, nonsticky, nonplastic, 0 to 15% rock fragments, (range 5 to 20" thick).

Subsoil/Substratum - 10 to 60"+ pale brown gravelly sandy loam, weak subangular blocky to massive, nonsticky, nonplastic, 30 to 60% rock fragments.

(Poorly drained soil)

Surface Soil - 0 to 16" very dark greyish brown silt loam, weak granular structure, nonsticky to slightly sticky, 0 to 20% rock fragments, (range 10 to 20" thick).

Subsoil - 16 to 48" greyish brown to grey (gleyed) gravelly sandy loam silt loam, subangular blocky structure, 20 to 50% rock fragments, (range 30 to 40" thick).

Substratum - 48 to 60"+ light grey gravelly sandy loam, massive, 30 to 60% rock fragments.

SOIL CLASSIFICATION - Andic Cryochrepts-Aquic Cryumbrepts complex.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Poorly drained soils occur in draws and depressions. Wetness is usually the result of topographic position rather than permeable layers, however, fragipans can occur. Organic rich, deep sandy nonskeletal soils occur as inclusions in abandoned stream channels.

VEGETATIVE CHARACTERISTICS - The dominant habitat types on well drained sites are subalpine fir/menziesia (ABLA/MEFE) and beargrass (ABLA/XETE) with pachistima (ABLA/PAMY) at lower elevations. Poorly drained areas have alder, fern, and sedge vegetation.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect low potential hazard ratings. However, because of the close proximity to major streams, sediment producing activities have a high potential for watershed damage. Streams on this landtype have a low sediment storage capability and adjacent trough wall landtypes can have high sediment production and delivery potential.

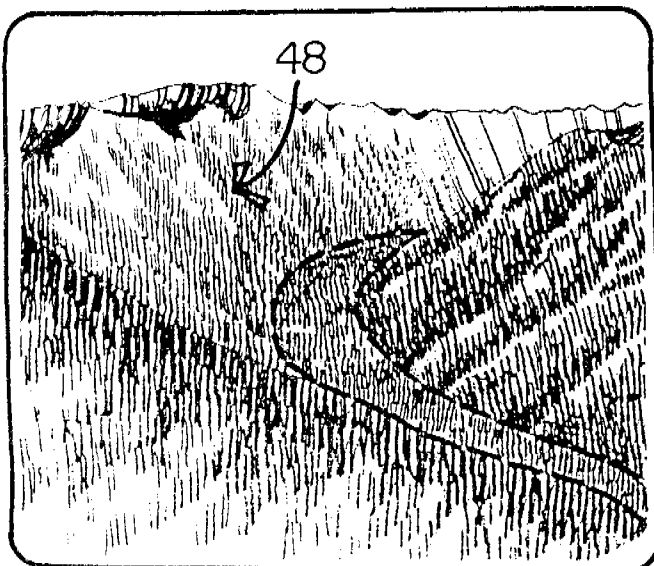
ENGINEERING - Potential road construction problems are associated with wet areas. Rapid brush encroachment and treadwear on rocky road surfaces are maintenance problems.

SILVICULTURE - Silvicultural limitations are related to high water tables, severe brush competition, umbric soil surfaces, and high surface rock fragment contents. Extensive timber harvest on this and adjacent landtypes may raise water tables sufficiently to cause a change in plant succession patterns. Overstory removal may result in frost pocket formation. Windthrow hazard is rated high.

POTENTIAL WILDLIFE HABITAT - This landtype is rated high in potential for summer habitat because of abundant food, water, cover, and diversity. Winter habitat is rated low because this unit does not occur at lower elevations which are accessible to wildlife in winter.



LANDTYPE 48-L66



SUMMARY

Number of map delineations - 115
Total acreage - 18,500
Average map unit acreage - 160

These units are located on high elevation, cool aspect, undissected glacial trough walls. Soils are deep, well drained, and are developed in glacial till parent material. The habitat type is subalpine fir/menziesia.

LANDFORM 48-NONDISSECTED TROUGH WALLS

Overall relief consists of sideslopes of U-shaped glaciated valleys. Bedrock scouring or glacial till deposition results from ice movement.

PHYSICAL LANDFORM CHARACTERISTICS

- A. Elevation Range - 4,000 to 7,500 feet
- B. Slope Gradient - 40 to 60%
- C. Slope Shape - Concave vertically, concave to convex laterally depending on the orientation of glacial ice
- D. Overall Relief - 500 to 2,500 feet
- E. Dissection Spacing - 1,000 feet
- F. Dissection Relief - 15 feet
- G. Dissection Density - 1 to 5 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Coarse textured parallel; very weakly expressed, if at all.

STREAM DENSITY:

MEAN:

PRIMARY STREAM ORDER: 1 and 2 (85%)

CHANNEL TYPE: Steep rectangular, weakly incised in unconsolidated tills, streams head low in the unit or above the unit.

SLOPE WATER MOVEMENT: Subsurface with moderately rapid downslope movement because the tills are highly permeable and overlie hard scoured bedrock.

SEDIMENT DELIVERY: Slopes and channels are highly efficient; low storage capacity.

PARENT MATERIAL GROUP

This group includes glacial till from various bedrock groups and reflects the lithology of the local drainage. Depositional material over hard scoured bedrock.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations above 4,000 feet on low energy slopes. Soil profiles are 60+ inches deep. Surface soil is volcanic ash 9 to 19 inches thick. Subsurface soil is coarse textured with 20 to 60% rock fragments. Large ice deposited surface rocks are common.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 13" dark brown silt loam with weak granular structure, nonsticky, nonplastic (range 9 to 19" thick).

Subsoil - 13 to 38" brown gravelly sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 30 to 55% rock fragments (range 10 to 35" thick).

Substratum - 38 to 60"+ pale brown gravelly loamy sand, structureless, nonsticky, nonplastic, 35 to 60% rock fragments.

SOIL CLASSIFICATION - Andic Cryochrepts, loamy-skeletal, mixed, and Typic Cryandepts, medial/loamy-skeletal, mixed.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Shallow droughty soils that can be either residual or mixed tillis occur on points. Thin (2 to 5") A1 horizons are common to the unit.

VEGETATIVE CHARACTERISTICS - The dominant habitat types are subalpine fir/menziesia (ABLA/MEFE) and beargrass (ABLA/XETE). Lower elevations may have subalpine fir/pachistima (ABLA/PAMY) and western red cedar/pachistima habitat types.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect low to moderate potential hazard ratings. Increased flows resulting from vegetative removal can result in severe scouring of streams in adjacent 47L91 landtypes which do not normally handle such large volumes of water.

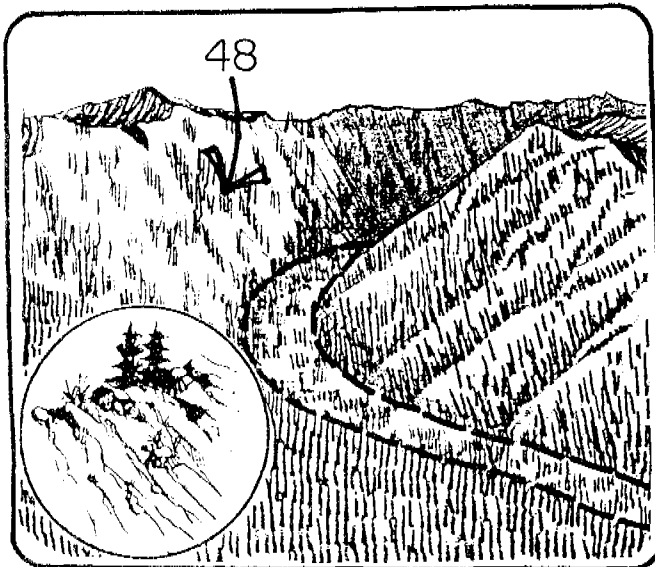
ENGINEERING - This unit has no significant road construction problems except in localized wet areas. Rapid brush encroachment, cutbank raveling, and treadwear in rocky road surfaces are maintenance problems.

SILVICULTURE - Silvicultural limitations are related to severe brush competition and large percentages of surface rock fragments. Extensive timber harvest on this unit may result in raising the water table on adjacent 47L91 landtypes.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate for potential summer habitat. The winter habitat rating is low because of inaccessibility caused by snow accumulations.



LANDTYPE 48-L80



SUMMARY

Number of map delineations - 64
Total acreage - 11,250
Average map unit acreage - 176

These units are located on high elevation, warm aspect, nondissected glacial trough walls. Soils are moderately deep, excessively drained, and are developed in glacial till parent material. The habitat type is subalpine fir/beargrass. Rock outcrop comprises 15 to 40% of this unit.

LANDFORM 48-NONDISSECTED TROUGH WALLS

Overall relief consists of sideslopes of U-shaped glaciated valleys. Bedrock scouring or glacial till deposition results from ice movement.

PHYSICAL LANDFORM CHARACTERISTICS

- A. Elevation Range - 4,800 to 7,500 feet
- B. Slope Gradient - 40 to 60+%
- C. Slope Shape - Concave vertically, concave to convex laterally depending on the orientation of glacial ice
- D. Overall Relief - 500 to 2,500 feet
- E. Dissection Spacing - 1,000 feet
- F. Dissection Relief - 15 feet
- G. Dissection Density - 1 to 5 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Coarse textured, rectangular; very weakly expressed, if at all.

STREAM DENSITY:
MEAN:

PRIMARY STREAM ORDER: 1 and 2 (85%)

CHANNEL TYPE: Steep, weakly dissected on hard bedrock, high energy, slight grading, streams head low in the unit or above the unit.

SLOPE WATER MOVEMENT: Rapid surface runoff because of thin soils and rock outcrop. Stream flow is flashy.

SEDIMENT DELIVERY: Slopes and channels are highly efficient; low sediment storage capacity.

OTHER IMPORTANT CHARACTERISTICS: Snowslides and avalanches are common.

PARENT MATERIAL GROUP

This group includes glacial till from various bedrock groups and reflects the lithology of the local drainage. Rock outcrop comprises 15 to 40% of this unit.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations above 4,800 feet on warm aspect slopes. Soil depths are variable but profiles tend to be droughty. Surface soil is coarse textured 3 to 9 inches deep and may contain mixed volcanic ash. Subsurface soil is coarse textured with 30 to 70% rock fragments. Large ice deposited surface rocks are common.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 8" brown gravelly sandy loam, weak granular structure, nonsticky, nonplastic, 20 to 50% rock fragments, (range 3 to 9" thick).

Subsoil - 8 to 36" brown very gravelly sandy loam, structureless, 40 to 70% rock fragments, (range 20 to 36" thick).

Substratum - 36 to 48" light yellowish brown gravelly loamy sand, structureless, nonsticky, nonplastic, 40 to 70% rock fragments.

SOIL CLASSIFICATION - Andic Cryochrepts, loamy-skeletal, mixed, Dystric Cryochrepts, loamy-skeletal, mixed, and rock outcrops.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Soils are highly variable and range from deep tills in dissections to shallow (lithic <20") soils in scoured. Mixed ash caps may be present in protected areas.

VEGETATIVE CHARACTERISTICS - The dominant habitat types are subalpine fir/beargrass (ABLA/XETE) and subalpine fir/whortleberry (ABLA/VASC).

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a high surface erosion potential, and a high sediment delivery efficiency.

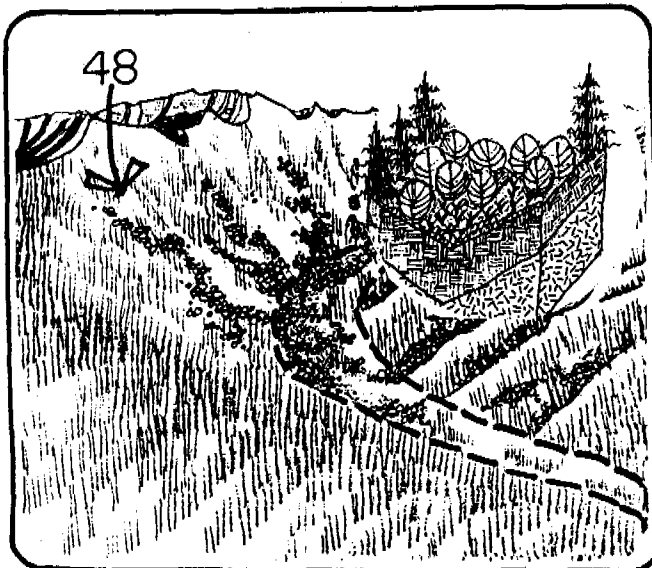
ENGINEERING - Potential road construction problems include a high debris avalanche hazard with a moderate risk of sediment being delivered to streams. Rock outcrop is common. Treadwear in rocky road surfaces and rock falls are maintenance problems. Snow avalanches are common.

SILVICULTURE - Major silvicultural limitations are shallow, droughty soils with rock outcrops, large percentages of surface rock and high insolation rates. Maintenance of surface organic matter is essential to maintaining productivity. Use of prescribed fire should be limited.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate for summer range based on the lack of water and low for winter range due to inaccessibility caused by snow.



LANDTYPE 48-L91



SUMMARY

Number of map delineations - 32
Total acreage - 6,100
Average map unit acreage - 191

These units are located on high elevation, undissected glacial trough walls. Soils are well drained on straight or convex slopes and poorly drained in glacial depression areas and concave slopes. Soils have deep profiles developed in glacial till parent material. The habitat type is subalpine fir/pachistima and menziesia with riparian vegetation in wet depression areas.

LANDFORM 48-NONDISSECTED TROUGH WALLS

Overall relief consists of sideslopes of U-shaped glaciated valleys. Bedrock scouring or glacial till deposition results from ice movement.

PHYSICAL LANDFORM CHARACTERISTICS

- A. Elevation Range - 4,800 to 7,500 feet
- B. Slope Gradient - 40 to 60+%
- C. Slope Shape - Concave vertically, concave to convex laterally depending on the orientation of glacial ice
- D. Overall Relief - 500 to 2,500 feet
- E. Dissection Spacing - 1,000 feet
- F. Dissection Relief - 15 feet
- G. Dissection Density - 1 to 5 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Coarse textured rectangular, very weakly expressed, if at all.

STREAM DENSITY:
MEAN:

PRIMARY STREAM ORDER: 1 and 2 (85%)

CHANNEL TYPE: Steep rectangular, weakly incised in unconsolidated tills, high energy, slight grading.

SLOPE WATER MOVEMENT: Subsurface with seeps, springs, and perched water tables occurring over large portions of the unit over entire years; flows are well regulated.

SEDIMENT DELIVERY: Slopes are highly efficient; low storage capacity.

OTHER IMPORTANT CHARACTERISTICS:

PARENT MATERIAL GROUP

This group includes glacial till from various bedrock groups and reflects the lithology of the local drainage. Depositional material overlies hard scoured bedrock.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations above 4,800 feet on all aspect slopes. Soil profiles are 48 to 60+ inches deep. Well drained soils have a volcanic ash surface 6 to 18 inches thick. Poorly drained depression soils have a darkened, modified volcanic ash surface 10 to 22 inches thick. Subsurface soil is coarse textured with 20 to 60% rock fragments. Large ice deposited surface rock are common.

TYPICAL SOIL PROFILES

(Well drained soil)

Surface Soil - 0 to 10" dark brown silt loam, weak, granular structure, nonsticky, nonplastic, 0 to 20% rock fragments, (range 6 to 18" thick).

Subsoil/Substratum - 10 to 60"+ pale brown gravelly sandy loam, weak subangular blocky to massive, nonsticky, nonplastic, 30 to 60% rock fragments.

(Poorly drained soil)

Surface Soil - 0 to 16" very dark greyish brown silt loam, weak, granular structure, nonsticky to slightly sticky, 0 to 20% rock fragments, (range 10 to 22" thick).

Subsoil - 16 to 48" greyish brown to grey (gleyed) gravelly sandy loam silt loam, subangular blocky structure, 20 to 50% rock fragments, (range 30 to 40" thick).

Substratum - 48 to 60"+ light grey gravelly sandy loam, massive 30 to 60% rock fragments.

SOIL CLASSIFICATION - Andic Cryochrepts, loamy-skeletal, mixed, and Andic Cryumbrepts, Toamy-skeletal, mixed.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Poorly drained soils occur in draws and depressions. Wetness is usually the result of topographic position rather than permeable layers, however, fragipans can occur. Poorly drained areas comprise 15 to 40% of this unit. Shallow soils occur on scoured points and ribs.

VEGETATIVE CHARACTERISTICS - The dominant habitat types on well drained sites are subalpine fir/pachistima (ABLA/PAMY) and menziesia (ABLA/MEFE), with beargrass (ABLA/XETE) on drier ridges. Poorly drained areas have alder, fern, and sedge vegetation.

MANAGEMENT CONSIDERATIONS

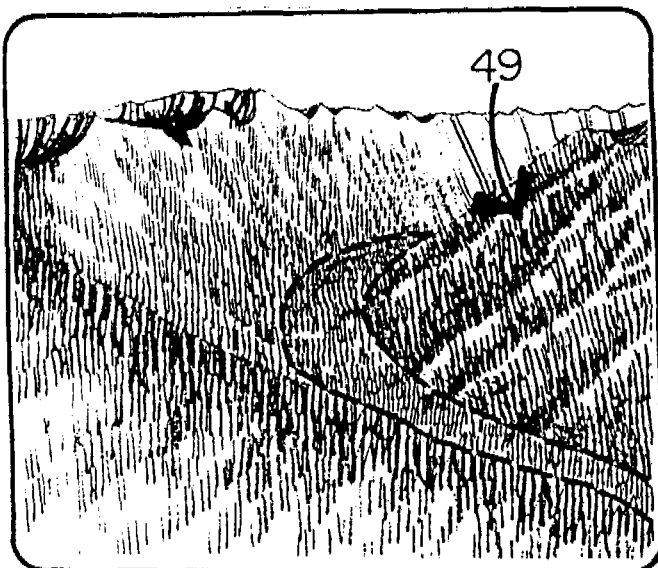
WATERSHED - Watershed interpretations reflect a high rotational mass wasting potential and a high sediment delivery efficiency. Increased flows resulting from vegetative removal can result in severe scouring in dissections and streams in adjacent 47L91 landtypes which do not normally handle such large volumes of water.

ENGINEERING - Potential road construction problems are associated with wet areas and include a high mass wasting hazard with a moderate risk of sediment being delivered to streams. Brush encroachment, cutbank sloughing, and treadwear in rocky road surfaces are maintenance problems.

SILVICULTURE - Silvicultural limitations are related to high water tables, severe brush encroachment, dark colored umbric soils, and large percentages of surface rock fragments. Extensive timber harvest on this unit may result in raising the water table on adjacent 47L91 landtypes. The windthrow hazard is high on this unit, primarily because of high water tables.

POTENTIAL WILDLIFE HABITAT - This landtype has properties such as food, water, cover, and vegetative diversity which are important components of wildlife habitat. Because of the high elevation, this landtype is inaccessible in the winter and has high potential primarily as summer range.

LANDTYPE 49-L66



SUMMARY

Number of map delineations - 12
Total acreage - 1,160
Average map unit acreage - 92

These units are located in high elevation, cool aspect, dissected glacial trough walls. Soils are deep, well drained, and are developed in glacial till parent material. The habitat type is subalpine fir/menziesia.

LANDFORM 49-DISSECTED TROUGH WALLS

Overall relief consists of the dissected sideslopes of U-shaped glaciated valleys. Bedrock scouring and glacial till deposition is the result of ice movement.

PHYSICAL LANDFORM CHARACTERISTICS

- A. Elevation Range - 4,200 to 7,500 feet
- B. Slope Gradient - 40 to 60%
- C. Slope Shape - Concave vertically, concave to convex laterally depending on the orientation of glacial ice
- C. Overall Relief - 500 to 2,500 feet
- E. Dissection Spacing - 300 to 1,000 feet
- F. Dissection Relief - 15 to 150 feet
- G. Dissection Density - 5 to 15 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Moderate textured parallel.

STREAM DENSITY:
MEAN:

PRIMARY STREAM ORDER: 1 and 2 (90%)

CHANNEL TYPE: Steep, moderately dissected in unconsolidated tills; high energy, somewhat graded.

SLOPE WATER MOVEMENT: Subsurface, with rapid downslope movement because tills are highly permeable and overlie hard, scoured bedrock.

SEDIMENT DELIVERY: Slopes and channels are highly efficient, low storage capacity.

OTHER IMPORTANT CHARACTERISTICS: Snow slides and avalanches are common.

PARENT MATERIAL GROUP

This group includes glacial till from various bedrock types and reflect the lithology of the local drainage. Despositional material overlies hard, scoured bedrock.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations above 4,200 feet on low energy slopes. Soil profiles are 60+ inches deep. Surface soil is volcanic ash 9 to 18 inches thick. Subsurface soil is coarse textured with 20 to 60% rock fragments. Large ice deposited surface rocks are common.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 13" dark brown silt loam with weak granular structure, nonsticky, nonplastic (range 9 to 18" thick).

Subsoil - 13 to 38" brown gravelly sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 20 to 55% rock fragments (range 10 to 30" thick).

Substratum - 38 to 60"+ pale brown gravelly loamy sand, structureless, nonsticky, nonplastic, 25 to 60% rock fragments.

SOIL CLASSIFICATION - Andic Cryochrepts, loamy-skeletal, mixed, and Typic Cryandeps, medial/loamy-skeletal, mixed.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Shallow droughty soils that can be either residual or mixed tills occur on ridges and points. Thin (2 to 5") A1 horizons are common to the unit.

VEGETATIVE CHARACTERISTICS - The dominant habitat types are subalpine fir/menziesia (ABLA/MEFE) and subalpine fir/beargrass (ABLA/XETE). Smaller areas of subalpine fir/pachistima (ABLA/PAMY) and western red cedar/pachistima (THPL/PAMY) occur at lower elevations.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a high rotational mass wasting potential and a very high sediment delivery efficiency. Increased flows resulting from vegetative removal can result in severe scouring in dissections and streams in adjacent 47L91 landtypes which do not normally handle such large volumes of water.

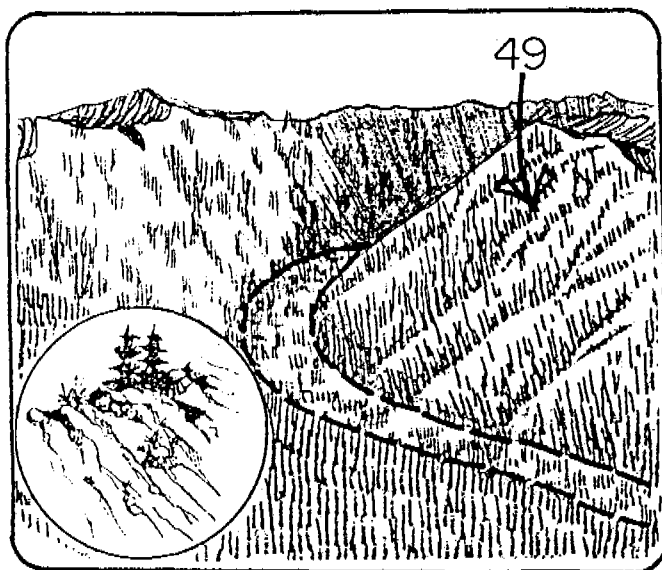
ENGINEERING - Potential road construction problems include a high mass wasting hazard with a high risk of sediment being delivered to streams. Brush encroachment and treadwear in rocky road surfaces are maintenance problems.

SILVICULTURE - Silvicultural limitations are related to severe brush competition, and large percentages of surface rock fragments. Extensive timber harvest on this unit may result in raising the water table on adjacent 47L91 landtypes.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate for potential summer habitat. The winter habitat rating is low because of inaccessibility caused by snow accumulations.



LANDTYPE 49-L80



SUMMARY

Number of map delineations - 24
Total acreage - 4,800
Average map unit acreage - 200

These units are located on high elevation, dissected glacial trough walls. Soils are variable in depth, excessively drained, and are developed in glacial till parent material. The habitat type is subalpine fir/beargrass. Rock outcrop comprises from 10 to 25% of this unit.

LANDFORM 49-DISSECTED TROUGH WALLS

Overall relief consists of the dissected sideslopes of U-shaped glaciated valleys. Bedrock scouring and glacial till deposition is the result of ice movement.

PHYSICAL LANDFORM CHARACTERISTICS

- A. Elevation Range - 4,800 to 7,500 feet
- B. Slope Gradient - 40 to 60%
- C. Slope Shape - Concave vertically, concave to convex laterally depending on the orientation of glacial ice
- D. Overall Relief - 500 to 2,500 feet
- E. Dissection Spacing - 300 to 1,000 feet
- F. Dissection Relief - 15 to 150 feet
- G. Dissection Density - 5 to 15 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Moderate textured, rectangular.

STREAM DENSITY:
MEAN:

PRIMARY STREAM ORDER: 1 and 2 (90%)

CHANNEL TYPE: Steep, moderately dissected on hard bedrock, high energy, somewhat graded.

SLOPE WATER MOVEMENT: Flashy over portions of unit with scoured bedrock and thin tills, subsurface flows occur in pockets of deep tills.

SEDIMENT DELIVERY: Slopes and channels are highly efficient, low storage capacity.

OTHER IMPORTANT CHARACTERISTICS: Snow slides and avalanches.

PARENT MATERIAL GROUP

This group includes glacial till from various bedrock groups, and reflects the lithology of the local drainage. Rock outcrop comprises 15 to 40% of this unit. Depositional material overlies hard, scoured bedrock.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations above 4,800 feet on warm aspect slopes. Soil depths are variable but tend to be droughty. Surface soil is coarse textured 3 to 10" deep and may contain mixed volcanic ash. Subsurface soil is coarse textured with 30 to 70% rock fragments. Ice deposited surface rocks are common.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 8" brown gravelly sandy loam, weak granular structure, nonsticky, nonplastic, 20 to 50% rock fragments, (range 3 to 20" thick).

Subsoil - 8 to 36" brown very gravelly sandy loam, structureless, 40 to 70% rock fragments, (range 10 to 35" thick).

Substratum - 36 to 48" light yellowish brown gravelly loamy sand, structureless, nonsticky, nonplastic, 40 to 70% rock fragments.

SOIL CLASSIFICATION - Andic Cryochrepts, loamy-skeletal, mixed, Typic Cryochrepts, loamy-skeletal, mixed, and rock outcrop.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Soils are highly variable and range from deep tills in dissections to shallow (lithic <20") soils in scoured. Mixed ash caps may be present in protected areas. Soil depths range from <30" to, in some cases, 50"+.

VEGETATIVE CHARACTERISTICS - The dominant habitat types are subalpine fir/beargrass (ABLA/XETE) and subalpine fir/whortleberry (ABLA/VASC).

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a very high debris avalanche potential with a high surface erosion potential and sediment delivery efficiency. Maximum vegetative cover should be maintained.

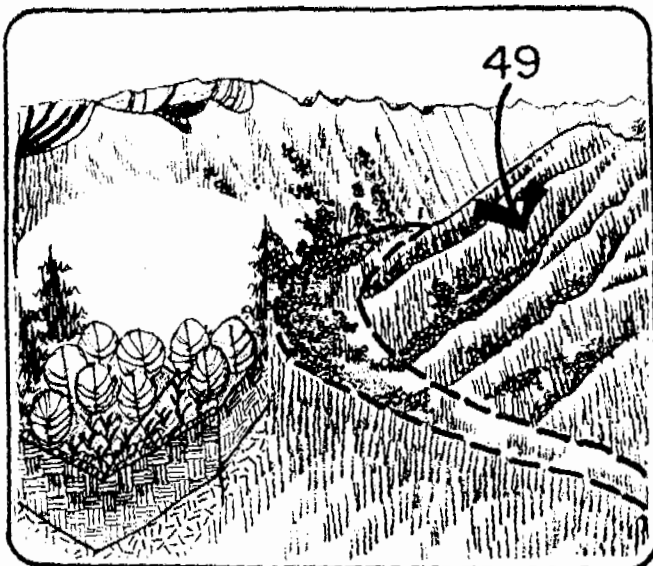
ENGINEERING - Potential road construction problems include a very high debris avalanche hazard with a high risk of sediment being delivered to streams. Rock outcrops are common. Treadwear in rocky road surfaces is a maintenance problem. Snow avalanches are common.

SILVICULTURE - Major silvicultural limitations are shallow, droughty soils with rock outcrops, large percentages of surface rock and high insolation rates.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate for summer range based on the lack of water and low for winter range due to inaccessibility caused by snow.



LANDTYPE 49-L91



SUMMARY

Number of map delineations - 8
Total acreage - 1,400
Average map unit acreage - 175

These units are located on high elevation, dissected glacial trough walls. Soils are well drained on straight or convex slopes and poorly drained in glacial depression areas and concave slopes. Soils have deep profiles developed in glacial till parent material. The habitat type is subalpine fir/pachistima and menziesia with riparian vegetation in wet depression areas.

LANDFORM 49-DISSECTED TROUGH WALLS

Overall relief consists of the dissected sideslopes of U-shaped glaciated valleys. Bedrock scouring and glacial till deposition is the result of ice movement.

PHYSICAL LANDFORM CHARACTERISTICS

- A. Elevation Range - 4,200 to 7,500 feet
- B. Slope Gradient - 40 to 60%
- C. Slope Shape - Concave vertically, concave to convex laterally depending on the orientation of glacial ice
- D. Overall Relief - 500 to 2,500 feet
- E. Dissection Spacing - 300 to 1,000 feet
- F. Dissection Relief - 15 to 150 feet
- G. Dissection Density - 5 to 15 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Moderate textured, rectangular.

STREAM DENSITY:
MEAN:

PRIMARY STREAM ORDER: 1 and 2 (90%)

CHANNEL TYPE: Steep, moderately dissected in unconsolidated tills; high energy, somewhat graded.

SLOPE WATER MOVEMENT: Mostly subsurface, with seeps, springs, and perched water tables occurring between dissections with live streams in dissections; flows are well regulated throughout the year.

SEDIMENT DELIVERY: Slopes are highly efficient; low storage capacity.

OTHER IMPORTANT CHARACTERISTICS:

PARENT MATERIAL GROUP

This group includes glacial tills from various bedrock groups and reflects the lithology of the local drainage. Depositional material overlies hard, scoured bedrock.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations above 4,200 feet on all aspect slopes. Soil profiles are 48 to 60+ inches deep. Well drained ridge soils have a volcanic ash surface 5 to 20 inches thick. Poorly drained glacial scoured depression soils have a darkened, modified volcanic ash surface 10 to 21 inches thick. Subsurface soil is coarse textured with 20 to 60% rock fragments. Ice deposited surface rocks are common.

TYPICAL SOIL PROFILES

(Well drained soil)

Surface Soil - 0 to 6" dark brown silt loam, weak granular structure, nonsticky, nonplastic, 0 to 20% rock fragments, (range 5 to 20" thick).

Subsoil/Substratum - 6 to 60"+ pale brown gravelly sandy loam, weak subangular blocky to massive, nonsticky, nonplastic, 30 to 60% rock fragments.

(Poorly drained soil)

Surface Soil - 0 to 16" very dark, greyish brown silt loam, weak granular structure, nonsticky to slightly sticky, 0 to 20% rock fragments, (range 10 to 21" thick).

Subsoil - 16 to 48" greyish brown to grey (gleyed) gravelly sandy loam silt loam, subangular blocky structure, 20 to 50% rock fragments, (range 30 to 40" thick).

Substratum - 48 to 60"+ light grey gravelly sandy loam, massive, 30 to 60% rock fragments.

SOIL CLASSIFICATION - Andic Cryochrepts, loamy-skeletal, mixed, and Typic Cryumbrepts, loamy-skeletal, mixed.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Poorly drained soils occur in draws and depressions. Wetness is usually the result of topographic position rather than permeable layers, however, fragipans can occur. Soil depths are highly variable.

VEGETATIVE CHARACTERISTICS - The dominant habitat types on well drained sites are subalpine fir/pachistima (ABLA/PAMY) and menziesia (ABLA/MEFE), with beargrass (ABLA/XETE) on drier areas. Poorly drained areas have alder, fern, and sedge vegetation. Western red cedar/pachistima (THPL/PAMY) occurs at elevations below 4,800 feet.

MANAGEMENT CONSIDERATIONS

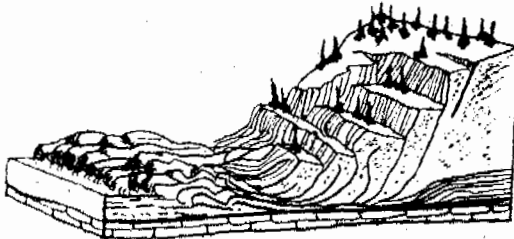
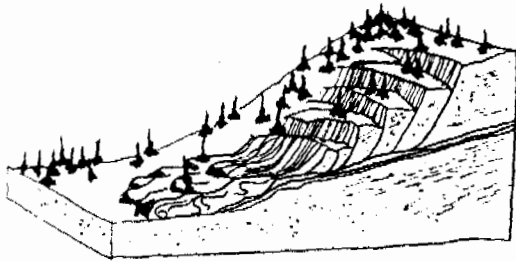
WATERSHED - Watershed interpretations reflect a high rotational mass wasting potential and a high sediment delivery efficiency. Increased flows resulting from vegetative removal can result in severe scouring in dissections and streams in adjacent 47L91 landtypes which do not normally handle such large volumes of water.

ENGINEERING - Potential road construction problems are associated with wet areas and include a high mass wasting hazard with a high risk of sediment being delivered to streams. Rapid brush encroachment, cutbank sloughing, and treadwear in rocky road surfaces are maintenance problems.

SILVICULTURE - Silvicultural limitations are related to high water tables, severe brush competition, dark colored umbric soils, and large percentages of surface rock fragments. Extensive timber harvest on this unit may result in raising the water table on adjacent 47L91 landtypes. The windthrow hazard rating is high on this unit, primarily because of high water tables.

POTENTIAL WILDLIFE HABITAT - This landtype has properties such as food, cover, and vegetative diversity which are important components of wildlife habitat. Because of the high elevation, this landtype is inaccessible in the winter and has high potential as summer range.

LANDTYPE 50



SUMMARY

Number of map delineations - 353
Total acreage - 33,900
Average map unit acreage - 96

These units are located at all elevations and aspects on mass wasted slopes. Soils are highly variable, ranging from thin and excessively well drained on scarp faces to deep and poorly drained in the slump mass. All parent materials are represented.

LANDFORM 50 MASS WASTED SLOPES

The unit consists of historically unstable slopes which have undergone mass wasting. Overall relief is weakly dissected, benchy, hummocky topography with variable slope gradients.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 2,000 to 6,000 feet
- B. Slope Gradients - 20 to 60%
- C. Slope Shape - Variable, scarp faces, benchy and hummocky
- D. Overall Relief - 100 to 1,000 feet
- E. Dissection Spacing - Variable
- F. Dissection Relief - Weak entrenchment
- G. Dissection Density - Variable

SLOPE HYDROLOGY

DRAINAGE PATTERN: None

STREAM DENSITY: 3-7 miles/mile²
MEAN: 5.25 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (90%)

CHANNEL TYPE: Little or no development, extremely variable.

SLOPE WATER MOVEMENT: Mostly subsurface with some springs and bogs.

SEDIMENT DELIVERY: High but variable.

PARENT MATERIAL GROUP

Mass wasting occurs in most parent materials represented on the Forest. It is most common in faulted zones and in contact areas between two bedrock types. Micaceous schists appear to be most susceptible because of the differential weathering of layers which produces zones of weakness, and the mica content of the weathered material contributes to low shear strength.

SOIL-VEGETATIVE UNIT

Soils are highly variable because of the colluvial and mixing nature of the process. Soils range from thin, coarse textured, excessively well drained on scarp faces to deep, heavy textured, and gleyed in poorly drained areas. Soil development is related to age of the mass wasting and subsequent movement and mixing.

Vegetative habitat types are dominantly western red cedar/pachistima (THPL/PAMY) and lady fern (THPL/ATFI) on slump material. Grand fir/pachistima (ABGR/PAMY) occurs on droughty scarp faces.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a very high mass wasting potential and a high sediment delivery efficiency. These landtypes have a past history of mass movement and have potential for future watershed damage.

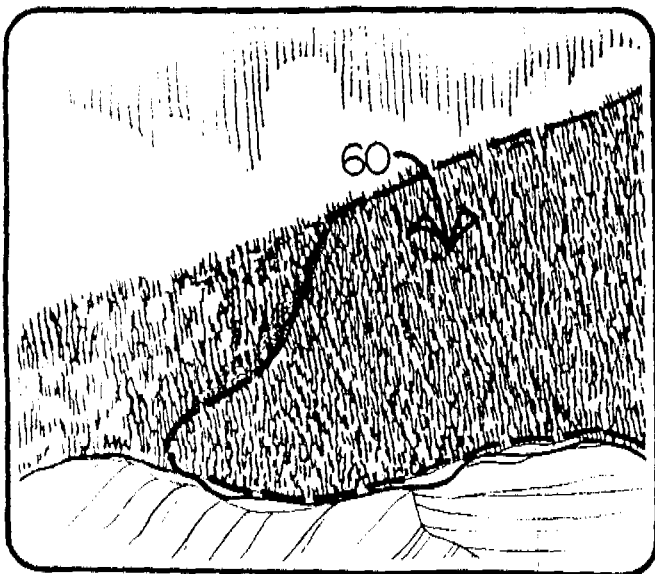
ENGINEERING - These landtypes are considered to be highly unstable by the nature of their formation. However, each must be evaluated individually when considering engineering limitations. Brush encroachment along with cut and fill sloughing are common maintenance problems.

SILVICULTURE - This landtype has silvicultural limitations related to high water tables and severe brush competition. The soil compaction potential is rated high because of wet conditions and mixed or missing ash surfaces. Windthrow hazard is high on this landtype. Silvicultural prescriptions should consider the effects of large scale tree harvest on stability.

POTENTIAL WILDLIFE HABITAT - This landtype is rated as having moderate potential for summer habitat. Where elevations are low enough to be accessible during periods of snow accumulation, winter habitat is rated as moderate.



LANDTYPE 60-G10



SUMMARY

Number of map delineations - 419
Total acreage - 23,900
Average map unit acreage - 57

These units are located on low elevation, cool aspect, nondissected stream breaklands. Soils are deep, well drained, and are developed in granitic parent material. The habitat type is western red cedar/pachistima.

LANDFORM 60 NONDISSECTED STREAM BREAKLANDS

Overall relief consists of nondissected or weakly dissected stream breaklands which occur adjacent to actively downcutting streams.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 1,600 to 4,800 feet
- B. Slope Gradient - Predominantly greater than 60%
- C. Slope Shape - Straight to concave both vertically and horizontally
- D. Overall Relief - Variable up to 3,000 feet
- E. Dissection Spacing - 500 to 2,500 feet averaging 1,300 feet
- F. Dissection Relief - 10 to 75 feet
- G. Dissection Density - 1 to 10 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Coarse parallel

STREAM DENSITY: 2-7 miles/mile²
MEAN: 4 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (70%)

CHANNEL TYPE: Weakly entrenched over hard bedrock, low width/depth ratio, high energy, bedrock controlled with nick points, ungraded, stable.

SLOPE WATER MOVEMENT: Primarily subsurface flows with moderately rapid downslope movement in permeable soils overlying hard, but fractured bedrock.

SEDIMENT DELIVERY: Slopes and channels are highly efficient with low storage capacity.

PARENT MATERIAL GROUP

This group includes weakly and moderately weathered granites and associated gneisses of the Idaho Batholith.



SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,800 feet on low energy slopes. Soil profiles are 60+ inches deep. Surface soil is volcanic ash 12 to 24 inches thick. Subsurface soil is coarse textured with 20 to 50% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 16" dark brown silt loam, with weak granular structure, nonsticky, nonplastic, (range 12 to 24" thick).

Subsoil - 16 to 30" brown gravelly sandy loam with granular structure, nonsticky, nonplastic, 20 to 50% rock fragments, (range 8 to 40" thick).

Substratum - 36 to 60"+ pale brown gravelly sandy loam, structureless, nonsticky, nonplastic, 20 to 50% rock fragments.

SOIL CLASSIFICATION - Typic Vitrandepts, medial/loamy-skeletal, mixed, frigid, and Andic Dystrochrepts, coarse-loamy, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Variations are limited to ash surface mixing in areas of active colluvial movement or the presence of clay accumulation horizons (argillics-weak alfisols) in moist draw soils. Approximately 60% of these units are skeletal and 40% are nonskeletal.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is western red cedar/pachistima (THPL/PAMY).

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect high mass wasting potential and a high sediment delivery efficiency. Other ratings are low to moderate.

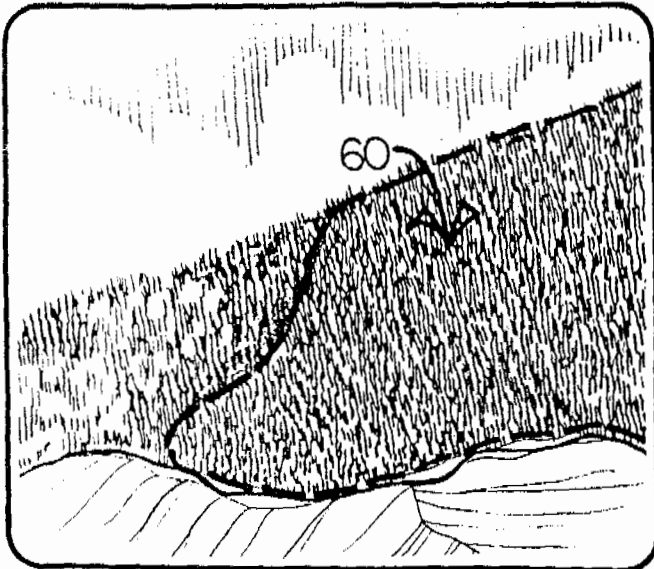
ENGINEERING - Potential road construction problems include a high mass wasting hazard with a high risk of sediment being delivered to streams. Rock falls are a common maintenance problem.

SILVICULTURE - There are no major silvicultural limitations for this landtype.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate as potential summer habitat and moderate for winter habitat at lower elevations where snow accumulation does not limit accessibility.



LANDTYPE 60-G20



SUMMARY

Number of map delineations - 182
Total acreage - 8,200
Average map unit acreage - 45

These units are located on low elevation, warm aspect, nondissected stream breaklands. Soils are deep, well drained, and are developed in granitic parent material. The habitat type is western red cedar/pachistima.

LANDFORM 60 NONDISSECTED STREAM BREAKLANDS

Overall relief consists of nondissected or weakly dissected stream breaklands which occur adjacent to actively downcutting streams.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 1,600 to 4,800 feet
- B. Slope Gradient - Predominantly greater than 60%
- C. Slope Shape - Straight to concave both vertically and horizontally
- D. Overall Relief - Variable up to 3,000 feet
- E. Dissection Spacing - 500 to 2,500 feet averaging 1,300 feet
- F. Dissection Relief - 10 to 75 feet
- G. Dissection Density - 1 to 10 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Coarse parallel

STREAM DENSITY: 2-7 miles/mile²
MEAN: 4 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (70%)

CHANNEL TYPE: Weakly entrenched over hard bedrock, low width/depth ratio, high energy, bedrock controlled with nick points, ungraded, stable.

SLOPE WATER MOVEMENT: Primarily subsurface flows with moderately rapid downslope movement in permeable soils overlying hard, but fractured bedrock.

SEDIMENT DELIVERY: Slopes and channels are highly efficient with low storage capacity.

PARENT MATERIAL GROUP

This group includes moderately to weakly weathered granites and associated gneisses of the Idaho Batholith.



SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,800 feet on high energy slopes. Soil profiles are 60+ inches deep. Surface soil is volcanic ash 7 to 16 inches thick. Subsurface soil is coarse textured with 20 to 50% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 12" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 7 to 16" thick).

Subsoil - 12 to 31" brown gravelly sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 10 to 50% rock fragments, (range 10 to 40" thick).

Substratum - 31 to 60"+ pale brown gravelly sandy loam, structureless, nonsticky, nonplastic, 20 to 50% rock fragments.

SOIL CLASSIFICATION - Andic Dystrachrepts, loamy-skeletal, mixed, frigid, and Typic Vitrandepts, medial/loamy, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Variations are limited to ash cap mixing in areas of colluvial movement or the presence of clay accumulation horizons (argillics-weak alfisols) in moist draws. Shallow (lithic) soils may occur in association with rock outcrops. Sixty percent of these units are skeletal and 40% are nonskeletal.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is western red cedar/pachistima (THPL/PAMY).

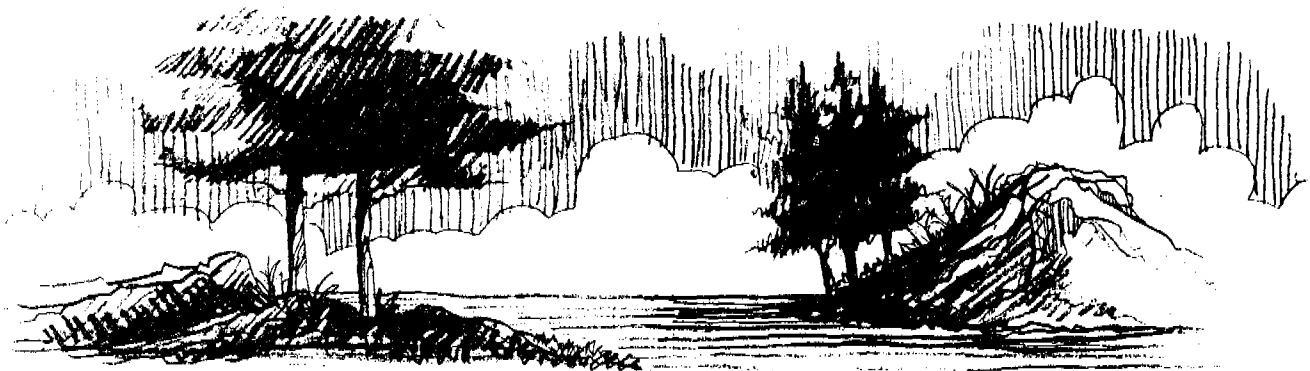
MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a high mass wasting potential and high sediment delivery efficiency. Other ratings are moderate.

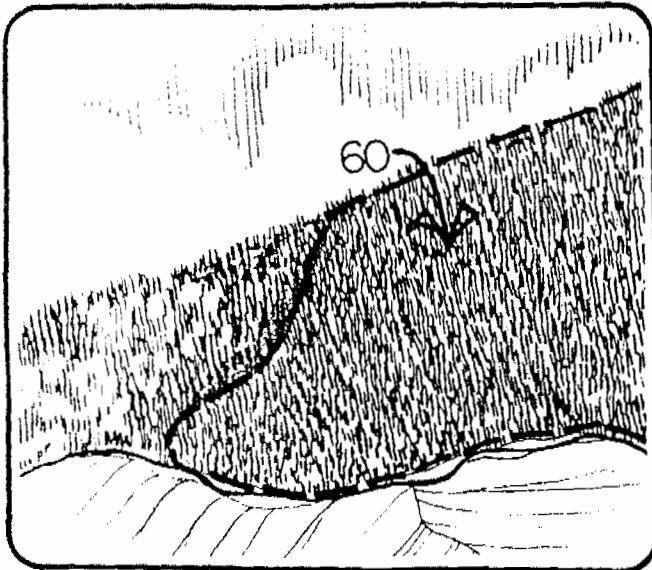
ENGINEERING - Potential road construction problems include a high mass wasting hazard with a high risk of sediment being delivered to streams. Cutbank raveling and rock falls are maintenance problems.

SILVICULTURE - The high insolation rate is a major silvicultural limitation for this landtype.

POTENTIAL WILDLIFE HABITAT - This landtype is rated low for potential summer habitat due to high insolation rates and lack of diversity. Winter habitat potential is rated moderate for those low elevations where snow depths do not limit access.



LANDTYPE 60-K10



SUMMARY

Number of map delineations - 39
Total acreage - 2,600
Average map unit acreage - 35

These units are located on low elevation, cool aspect, nondissected stream breaklands. Soils are deep, well drained, and are developed in grussic granitic parent material. The habitat type is western red cedar/pachistima.

LANDFORM 60 NONDISSECTED STREAM BREAKLANDS

Overall relief consists of nondissected or weakly dissected stream breaklands which occur adjacent to actively downcutting streams.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 2,200 to 4,800 feet
- B. Slope Gradient - Predominantly greater than 60%
- C. Slope Shape - Straight to concave both vertically and horizontally
- D. Overall Relief - Variable up to 3,000 feet
- E. Dissection Spacing - 500 to 2,500 feet averaging 1,300 feet
- F. Dissection Relief - 10 to 75 feet
- G. Dissection Density - 1 to 10 miles/mile²

WATER HYDROLOGY

DRAINAGE PATTERN: Coarse parallel

STREAM DENSITY: 2-7 miles/mile²
MEAN: 4 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (70%)

CHANNEL TYPE: Weakly entrenched over hard bedrock, low width/depth ratio, high energy, bedrock controlled with nick points, ungraded, stable.

SLOPE WATER MOVEMENT: Primarily subsurface flows with moderately rapid downslope movement in permeable soils overlying hard, but fractured bedrock.

SEDIMENT DELIVERY: Slopes and channels are highly efficient with low storage capacity.

PARENT MATERIAL GROUP

This group includes deeply weathered grussic granitics of the Idaho Batholith. Ash material is deposited over decomposed granitic material with very little soil development and is relatively impermeable.



SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,800 feet on low energy slopes. Soil profiles are 60+ inches deep. Surface soil is volcanic ash 7 to 18 inches thick. Subsurface soil is coarse textured with 20 to 50% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 14" dark brown silt loam to sandy loam with weak granular structure, nonsticky, nonplastic, (range 9 to 18" thick).

Subsoil - 14 to 24" brown gravelly sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 20 to 40% pea sized gravels, (range 6 to 23" thick).

Substratum - 24 to 60"+ pale brown gravelly loamy sand, structureless, nonsticky, nonplastic, 20 to 50% pea sized gravels.

SOIL CLASSIFICATION - Typic Vitrandepts, medial/sandy, mixed, frigid, and Dystrachrepts, loamy-skeletal, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Major soil variations are the ash surface horizon depth and degree of ash/subsoil mixing. This unit contains approximately 60% nonskeletal soils, with 40% skeletal.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is western red cedar/pachistima (THPL/PAMY).

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a high parent material erosion potential. Rotational mass wasting, subsoil erosion potential, and sediment delivery efficiency are rated high. Sediment control should be a major watershed management objective.

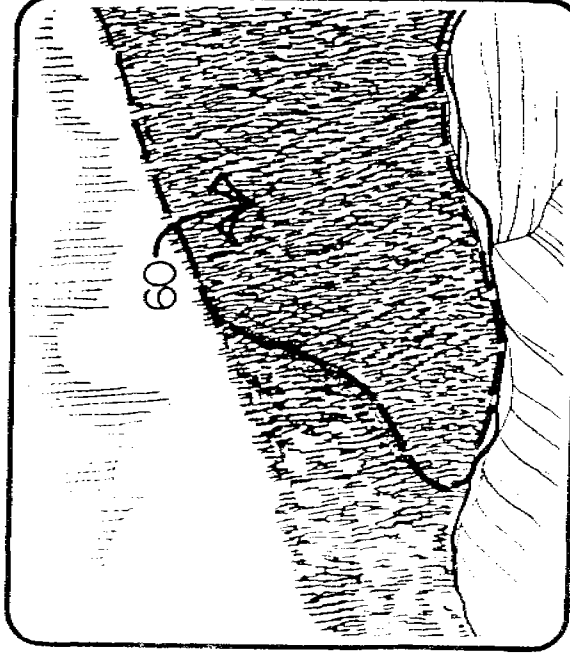
ENGINEERING - Potential road construction problems include a very high erosion hazard from the excavated road prism and a high mass wasting hazard, with a high risk of sediment being delivered to streams. Dry cutbank raveling is a maintenance problem.

SILVICULTURE - This landtype has no major silvicultural limitations. To maintain the moisture holding and nutrient supplying capacity of the volcanic ash topsoil, cable logging systems should use high lead on full suspension to avoid surface damage.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate as potential summer habitat and moderate for winter habitat at lower elevations where snow does not limit accessibility.



LANDTYPE 60-K20



SUMMARY

Number of map delineations - 24
Total acreage - 900
Average map unit acreage - 38

These units are located on low elevation, warm aspect, nondissected stream breaklands. Soils are deep, well drained, and are developed in gneissic parent material. The habitat type is western red cedar/pachistima.

LANDFORM 60 NONDISSECTED STREAM BREAKLANDS

Overall relief consists of nondissected or weakly dissected stream breaklands which occur adjacent to actively downcutting streams.

LANDFORM PHYSICAL CHARACTERISTICS

- Elevation Range - 2,200 to 4,800 feet
- Slope Gradient - Predominantly greater than 60%
- Slope Shape - Straight to concave both vertically and horizontally
- Overall Relief - Variable up to 3,000 feet
- Dissection Spacing - 500 to 2,500 feet averaging 1,300 feet
- Dissection Relief - 10 to 75 feet
- Dissection Density - 1 to 10 miles/mile²

SOIL HYDROLOGY

DRAINAGE PATTERN: Coarse parallel

STREAM DENSITY: 2-7 miles/mile²
MEAN: 4 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (70%)

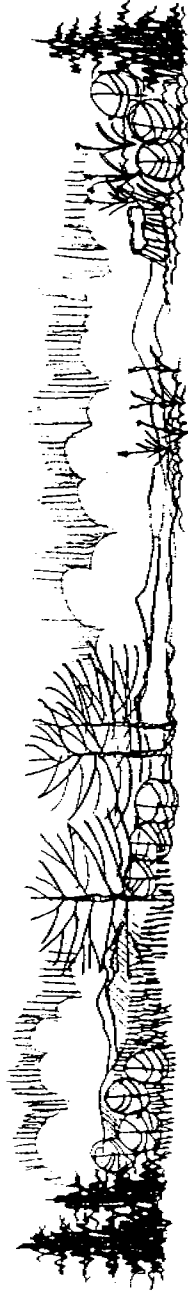
CHANNEL TYPE: Weakly entrenched over hard bedrock, low width/depth ratio, high energy, bedrock controlled with nick points, ungraded, stable.

SLOPE WATER MOVEMENT: Primarily subsurface flows with moderately rapid downslope movement in permeable soils overlying hard, but fractured bedrock.

SEDIMENT DELIVERY: Slopes and channels are highly efficient with low storage capacity.

PARENT MATERIAL GROUP

This group includes deeply weathered, gneissic granitics of the Idaho Batholith. Ash material lies directly above decomposed granitic material with very little soil development and is relatively impermeable.



SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,800 feet on high energy slopes. Soil profiles are 60+ inches deep. Surface soil is volcanic ash 6 to 17 inches thick. Subsurface soil is coarse textured with 20 to 50% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 12" dark brown silt loam to sandy loam with weak granular structure, nonsticky, nonplastic, (range 6 to 17" thick).

Subsoil - 12 to 24" brown gravelly sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 20 to 40% pea sized gravels, (range 5 to 25 inches thick).

Substratum - 24 to 60" pale brown gravelly loamy sand, structureless, nonsticky, nonplastic, 20 to 50% pea sized gravels.

SOIL CLASSIFICATION - Andic Dystrachrepts, sandy-skeletal, mixed, frigid, and Typic Vitrandepts, medial/loamy, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, and INCLUSIONS - Major soil variations are the ash surface horizon depth and degree of ash/subsoil mixing. This unit contains approximately 60% nonskeletal soils, with 40% skeletal.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is western red cedar/pachistima (THPL/PAMY).

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a very high parent material erosion potential and a high sediment delivery efficiency. Mass wasting, and subsoil erosion potentials are rated high. Sediment control should be a major watershed management objective.

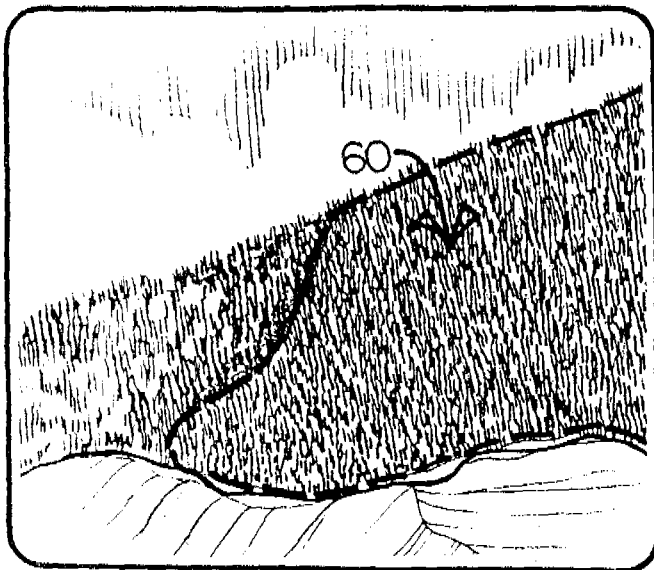
ENGINEERING - Potential road construction problems include a very high erosion hazard from the excavated road prism, a high mass wasting hazard, and a high debris avalanche hazard. Delivery efficiency of sediment to streams is also high. Dry cutbank raveling is a maintenance problem.

SILVICULTURE - This landtype has silvicultural limitations related to high insolation rates. Volcanic ash topsoil should be protected during cable skidding operations by using high lead or full suspension systems.

POTENTIAL WILDLIFE HABITAT - This landtype is rated low for potential summer habitat due to high insolation rates and lack of diversity. Winter habitat potential is rated moderate at low elevations where snow accumulations do not limit accessibility.



LANDTYPE 60-Q10



SUMMARY

Number of map delineations - 107
Total acreage - 8,900
Average map unit acreage - 83

These units are located on low elevation, cool aspect, nondissected stream breaklands. Soils are deep, well drained and developed in quartzite parent material. The habitat type is western red cedar/pachistima.

LANDFORM 60 NONDISSECTED STREAM BREAKLANDS

Overall relief consists of nondissected or weakly dissected stream breaklands which occur adjacent to actively downcutting streams.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 3,000 to 4,800 feet
- B. Slope Gradient - Predominantly greater than 60%
- C. Slope Shape - Straight to concave both vertically and horizontally
- D. Overall Relief - Variable up to 3,000 feet
- E. Dissection Spacing - 500 to 2,500 feet averaging 1,300 feet
- F. Dissection Relief - 10 to 75 feet
- G. Dissection Density - 1 to 10 miles/mile²

SOIL HYDROLOGY

DRAINAGE PATTERN: Coarse parallel

STREAM DENSITY: 2-7 miles/mile²
MEAN: 4 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (70%)

CHANNEL TYPE: Weakly entrenched over hard bedrock, low width/depth ratio, high energy, bedrock controlled with nick points, ungraded, stable.

SLOPE WATER MOVEMENT: Primarily subsurface flows with moderately rapid downslope movement in permeable soils overlying hard, but fractured bedrock.

SEDIMENT DELIVERY: Slopes and channels are highly efficient with low storage capacity.

PARENT MATERIAL GROUP

This group consists of weakly weathered quartzites, argillites, and siltites of the Belt Supergroup of sedimentary rocks, exclusive of the Revett Formation.



SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,800 feet on low energy slopes. Soil profiles are 60+ inches deep. Surface soil is volcanic ash 9 to 21 inches thick. Subsurface soil is coarse textured with 20 to 60% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 15" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 9 to 21" thick).

Subsoil - 15 to 31" brown gravelly sandy loam to silt loam with weak subangular blocky structure, nonsticky, nonplastic, 20 to 45% rock fragments, (range 10 to 36" thick).

Substratum - 31 to 60"+ pale brown gravelly sandy loam, structureless, nonsticky, nonplastic, 30 to 60% rock fragments.

SOIL CLASSIFICATION - Typic Vitrandepts, medial/loamy-skeletal, mixed, frigid, and Andic Dystrochrepts, loamy-skeletal, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Ash surface layer varies in depth and amount of mixing on steep colluvial slopes. Sandy loam textured subsoil weather from quartzite with silt loam textures weathering from siltites and argillites. Approximately 85% of the soils in this unit are skeletal, 15% are nonskeletal.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is western red cedar/pachistima (THPL/PAMY).

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a high sediment delivery efficiency. Other ratings are low to moderate. This is one of the more stable breakland units.

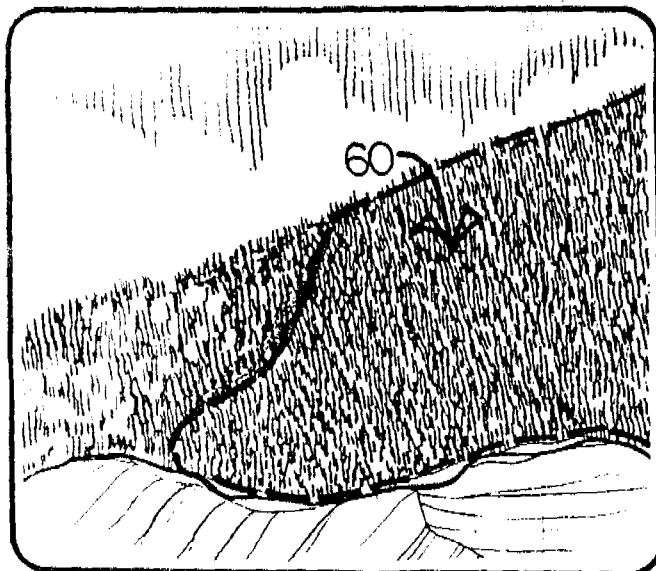
ENGINEERING - Potential road construction problems include a high sediment delivery efficiency with a moderate erosion hazard from the excavated road prism. Rock falls are a common maintenance problem.

SILVICULTURE - This landtype has no major silvicultural limitations.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate as potential summer habitat. Winter habitat is rated low because this unit does not generally occur at lower elevations which are accessible during periods of snow accumulation.



LANDTYPE 60-Q20



SUMMARY

Number of map delineations - 74
Total acreage - 5,300
Average map unit acreage - 72

These units are located on low elevation, warm aspect, nondissected stream breaklands. Soils are deep, well drained, and developed in quartzite parent material. The habitat type is western red cedar/pachistima.

LANDFORM 60 NONDISSECTED STREAM BREAKLANDS

Overall relief consists of nondissected or weakly dissected stream breaklands which occur adjacent to actively downcutting streams.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 3,000 to 4,800 feet
- B. Slope Gradient - Predominantly greater than 60%
- C. Slope Shape - Straight to concave both vertically and horizontally
- D. Overall Relief - Variable up to 3,000 feet
- E. Dissection Spacing - 500 to 2,500 feet averaging 1,300 feet
- F. Dissection Relief - 10 to 75 feet
- G. Dissection Density - 1 to 10 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Coarse parallel

STREAM DENSITY: 2-7 miles/mile²
MEAN: 4 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (70%)

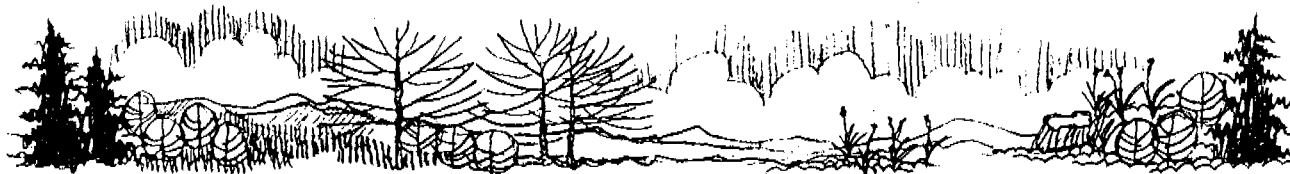
CHANNEL TYPE: Weakly entrenched over hard bedrock, low width/depth ratio, high energy, bedrock controlled with nick points, ungraded, stable.

SLOPE WATER MOVEMENT: Primarily subsurface flows with moderately rapid downslope movement in permeable soils overlying hard, but fractured bedrock.

SEDIMENT DELIVERY: Slopes and channels are highly efficient with low storage capacity.

PARENT MATERIAL GROUP

This group consists of weakly weathered quartzites, argillites, and siltites of the Belt Supergroup of sedimentary rocks, exclusive of the Revett Formation.



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SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,800 feet on high energy slopes. Soil profiles are 60+ inches deep. Surface soil is volcanic ash 9 to 16 inches thick. Subsurface soil is coarse textured with 30 to 60% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 12" dark brown silt loam with weak, granular structure, nonsticky, nonplastic, (range 9 to 16" thick).

Subsoil - 12 to 32" brown gravelly, sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 30 to 60% rock fragments, (range 10 to 30" thick).

Substratum - 32 to 60"+ pale brown gravelly, sandy loam, structureless, nonsticky, nonplastic, 30 to 60% rock fragments.

SOIL CLASSIFICATION - Andic Dystrochrepts, loamy-skeletal, mixed, frigid, and Typic Vitrandepts, medial/loamy-skeletal, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Ash surface layers vary in depth and amount of mixing with subsurface layer. The thin and highly mixed ash caps tend to occur on ridge points and upper southerly slopes. Sandy loam subsoil textures are associated with quartzite while silt loam textures are associated argillites and siltites. Approximately 85% of the soils in this unit are skeletal, 15% are nonskeletal.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is western red cedar/pachistima (THPL/PAMY) with small areas of grand fir/pachistima (ABGR/PAMY) on somewhat drier sites.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a high road sediment delivery efficiency. Other ratings are low to moderate. This is one of the more stable breakland units.

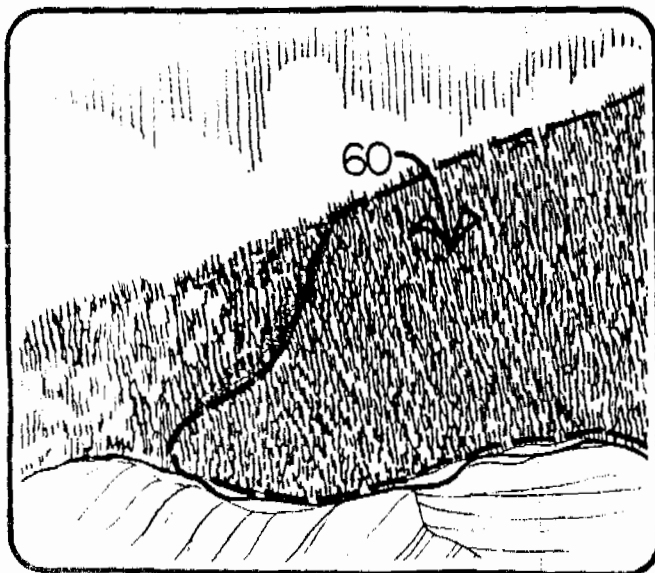
ENGINEERING - Potential road construction problems include a high sediment delivery efficiency with moderate sources of sediment such as avalanche debris and the erosion hazard from excavated road prisms. Rock falls are a common maintenance problem.

SILVICULTURE - A major silvicultural limitation is the high insolation rate which can be lethal to seedlings.

POTENTIAL WILDLIFE HABITAT - This landtype is rated low for potential summer habitat due to high insolation rates and lack of diversity. Winter habitat potential is rated moderate at low elevations where snow depths do not limit accessibility.



LANDTYPE 60-S10



SUMMARY

Number of map delineations - 148
Total acreage - 15,600
Average map unit acreage - 105

These units are located on low elevation, cool aspect, nondissected stream breaklands. Soils are deep, well drained, and developed in micaceous gneiss and schist parent material. The habitat type is western red cedar/pachistima.

LANDFORM 60 NONDISSECTED STREAM BREAKLANDS

Overall relief consists of nondissected or weakly dissected stream breaklands which occur adjacent to actively downcutting streams.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 1,600 to 4,800 feet
- B. Slope Gradient - Predominantly greater than 60%
- C. Slope Shape - Straight to concave both vertically and horizontally
- D. Overall Relief - Variable up to 3,000 feet
- E. Dissection Spacing - 500 to 2,500 feet averaging 1,300 feet
- F. Dissection Relief - 10 to 75 feet
- G. Dissection Density - 1 to 10 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Coarse parallel

STREAM DENSITY: 2-7 miles/mile²
MEAN: 4 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (70%)

CHANNEL TYPE: Weakly entrenched over hard bedrock, low width/depth ratio, high energy, bedrock controlled with nick points, ungraded, stable.

SLOPE WATER MOVEMENT: Primarily subsurface flows with moderately rapid downslope movement in permeable soils overlying hard, but fractured bedrock.

SEDIMENT DELIVERY: Slopes and channels are highly efficient with low storage capacity.

PARENT MATERIAL GROUP

This group consists of weathered micaceous schists, gneisses with imbedded pegmatites of the Belt Supergroup, commonly referred to as the high grade metamorphics of the Border Zone.



SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,800 feet on low energy slopes. Soil profiles are 60+ inches deep. Surface soil is volcanic ash 7 to 18 inches thick. Subsurface soil is medium to coarse textured with 20 to 40% rock fragments and an estimated 10 to 20% mica content.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 14" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 7 to 18" thick).

Subsoil - 14 to 25" brown gravelly sandy loam to loam with weak subangular blocky structure, nonsticky, nonplastic, 20 to 40% rock fragments, (range 10 to 35" thick).

Substratum - 25 to 60"+ pale brown sandy loam, structureless, nonsticky, nonplastic, 20 to 40% rock fragments.

SOIL CLASSIFICATION - Typic Vitrandepts, medial/loamy, mixed, frigid; Andic Dystrachrepts, Toamy-skeletal, mixed, frigid,; and Eutric Glossoboralfs, fine-loamy, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Heavier textured subsoils occur in moist draws and depressions. These finer textured soils have clay loam subsoils. Shallow (lithic - 20" deep) soils occur adjacent to bedrock outcrops. Approximately 50% of the soils in this unit are skeletal, 50% are nonskeletal.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is western red cedar/pachistima (THPL/PAMY).

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect high sediment delivery efficiencies. Mass wasting potential is also rated high. Other ratings are low and moderate.

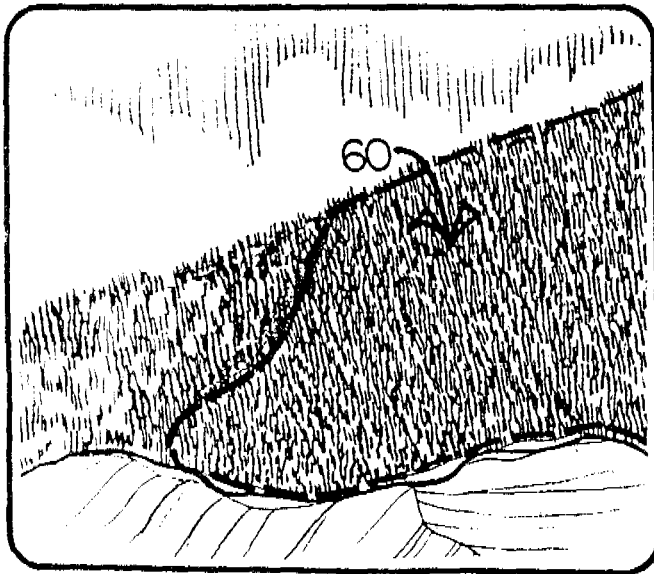
ENGINEERING - Potential road construction problems include a high mass wasting hazard with a avalanche fill failures. Full bench construction with end hauling of material will minimize the risk high risk of sediment being delivered to streams. Cutbank and fill sloughing are maintenance problems.

SILVICULTURE - This landtype has no major silvicultural limitations.

POTENTIAL WILDLIFE HABITAT - This landtype is rated as moderate for summer potential habitat and moderate for winter habitat at lower elevations where snow accumulations do not limit accessibility.



LANDTYPE 60-S20



SUMMARY

Number of map delineations - 86
Total acreage - 6,100
Average map unit acreage - 71

These units are located on low elevation, warm aspect, nondissected stream breaklands. Soils are moderately deep, well drained, and developed in micaceous gneiss and schist parent material. The habitat type is western red cedar/pachistima.

LANDFORM 60 NONDISSECTED STREAM BREAKLANDS

Overall relief consists of nondissected or weakly dissected stream breaklands which occur adjacent to actively downcutting streams.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 1,600 to 4,800 feet
- B. Slope Gradient - Predominantly greater than 60%
- C. Slope Shape - Straight to concave both vertically and horizontally
- D. Overall Relief - Variable up to 3,000 feet
- E. Dissection Spacing - 500 to 2,500 feet averaging 1,300 feet
- F. Dissection Relief - 10 to 75 feet
- G. Dissection Density - 1 to 20 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Coarse parallel

STREAM DENSITY: 2-7 miles/mile²
MEAN: 4 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (70%)

CHANNEL TYPE: Weakly entrenched over hard bedrock, low width/depth ratio, high energy, bedrock controlled with nick points, ungraded, stable.

SLOPE WATER MOVEMENT: Primarily subsurface flows with moderately rapid downslope movement in permeable soils overlying hard, but fractured bedrock.

SEDIMENT DELIVERY: Slopes and channels are highly efficient with low storage capacity.

PARENT MATERIAL GROUP

This group consists of weathered micaceous schists with interbedded gneisses and pegmatites of the Belt Supergroup.



SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,800 feet on high energy slopes. Soils are 30 to 48 inches deep. Surface soil is volcanic ash 7 to 16 inches thick. Subsurface soil is coarse textured with 20 to 40% rock fragments and an estimated 10 to 20% mica content.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 12" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 7 to 16" thick).

Subsoil - 12 to 32" brown sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 20 to 40% rock fragments, (range 10 to 40" thick).

Substratum - 32 to 48"+ pale brown sandy loam, structureless, nonsticky, nonplastic, 20 to 40% rock fragments.

SOIL CLASSIFICATION - Andic Dystrachrepts, loamy-skeletal, mixed; Typic Vitrandepts, medial/loamy-skeletal, mixed, frigid; and Eutric Glossoboralfs, fine-loamy, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Ash cap mixing is common on steeper slopes. Shallow soils are associated with rock outcrops. Soils with finer textured subsoils (alfisols) commonly occur in moist draws. Approximately 50% of the soils in this unit are skeletal, and 50% are nonskeletal.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is western red cedar/pachistima (THPL/PAMY). Somewhat drier sites support grand fir/pachistima (ABGR/PAMY).

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect high sediment delivery efficiencies. Mass wasting potential is also rated high. Other ratings are low and moderate.

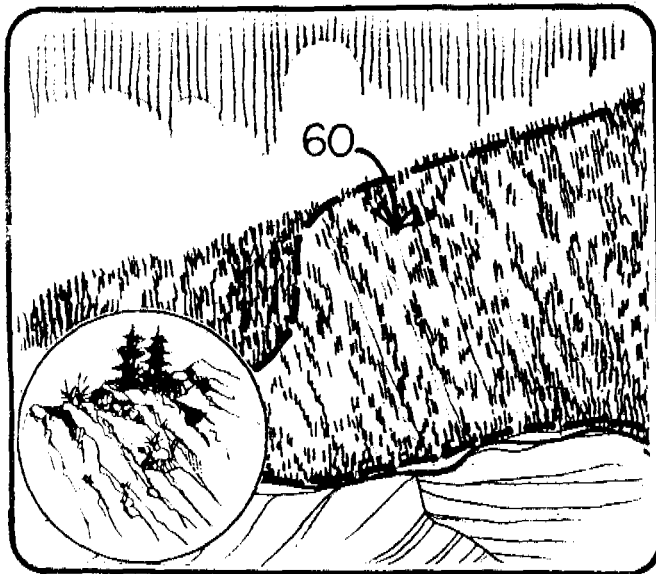
ENGINEERING - Potential road construction problems include a high mass wasting hazard with a high risk of sediment being delivered to streams. Cutbank and fill sloughing are maintenance problems.

SILVICULTURE - The major silvicultural limitation is the high insolation rate.

POTENTIAL WILDLIFE HABITAT - This landtype is rated low for potential summer habitat because of high insolation rates and lack of diversity. Winter habitat potential is rated moderate at low elevations where snow accumulations do not limit access.



LANDTYPE 60-U26



SUMMARY

Number of map delineations - 350
Total acreage - 15,800
Average map unit acreage - 45

These units are located on low elevation, warm aspect nondissected stream breaklands. Soils are moderately deep, somewhat excessively drained, and are developed in undifferentiated parent material. The habitat type is grand fir/pachistima. Rock outcrop comprises 25% of this unit.

LANDFORM 60 NONDISSECTED STREAM BREAKLANDS

Overall relief consists of nondissected or weakly dissected stream breaklands which occur adjacent to actively downcutting streams.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 1,600 to 4,800 feet
- B. Slope Gradient - Predominantly greater than 60%
- C. Slope Shape - Straight to concave both vertically and horizontally
- D. Overall Relief - Variable up to 3,000 feet
- E. Dissection Spacing - 500 to 2,500 feet averaging 1,300 feet
- F. Dissection Relief - 10 to 75 feet
- G. Dissection Density - 1 to 10 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Coarse parallel

STREAM DENSITY: 2-7 miles/mile²
MEAN: 4 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (70%)

CHANNEL TYPE: Weakly entrenched over hard bedrock, low width/depth ratio, high energy, bedrock controlled with nick points, ungraded, stable.

SLOPE WATER MOVEMENT: Overland flow is common on those portions of the unit with thin soils. Runoff is rapid, flashy and not well regulated.

SEDIMENT DELIVERY: Very efficient with low storage capacity.

PARENT MATERIAL GROUP

This group consists of weakly weathered undifferentiated bedrock. Lithologic type does not influence basic interpretive criteria.



SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,800 feet on high energy slopes. Soils are 30 to 48 inches deep and tend to be droughty. Surface soil is mixed volcanic ash 4 to 12 inches thick. Subsurface soil is coarse textured with 30 to 60% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 8" dark brown silt loam to sandy loam with weak granular structure, nonsticky, nonplastic, 10 to 20% rock fragments, (range 4 to 12" thick).

Subsoil - 8 to 36" brown gravelly sandy loam with weak subangular blocky structure, massive, nonsticky, nonplastic, 30 to 50% rock fragments, (range 20 to 35" thick).

Substratum - 36 to 48" pale brown sandy loam to loamy sand, structureless, nonsticky, nonplastic, 30 to 60% rock fragments.

SOIL CLASSIFICATION - Dystric Xerochrepts, loamy-skeletal, mixed, frigid, rock outcrops, and Andic Dystrichrepts, loamy-skeletal, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Shallow, excessively drained soils occur on ridges with deep, well drained profiles in draws and depressions. Shallow soils (lithic - 20" occur on sharp finger ridge points and in vicinity of rock outcrops. Mixed ash caps are sandy loam textured.

VEGETATIVE CHARACTERISTICS - The dominant habitat types are grand fir/pachistima (ABGR/PAMY) on well drained sites with grand fir/beargrass (ABGR/XETE) and Douglas-fir/ninebark (PSME/PHMA) on shallow soil sites. Moist draws and lower margins of the unit may have western red cedar/pachistima (THPL/PAMY).

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect high debris avalanche potentials and high sediment delivery efficiency.

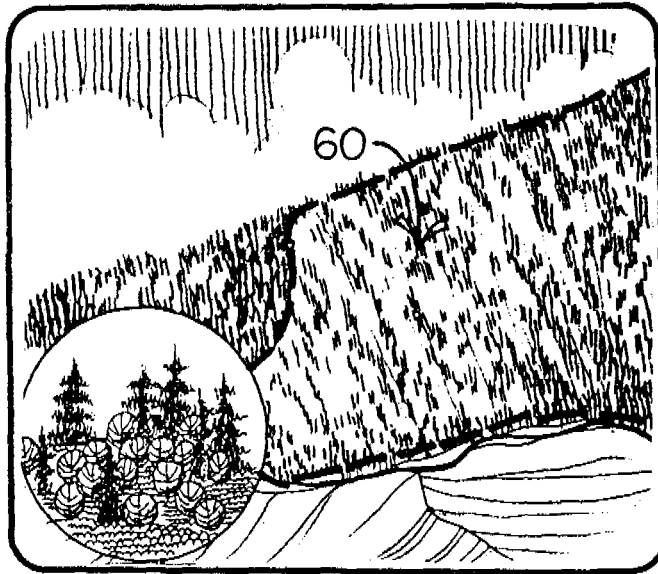
ENGINEERING - Potential road construction problems include a high erosion hazard from the excavated road prism, and a high debris avalanche hazard. The risk of sediment being delivered to streams is high. Dry cutbank raveling and rock falls are maintenance problems.

SILVICULTURE - Shallow, rocky, droughty soils with high insolation rates are major silvicultural limitations. Prescribed fires should be light and cool to maintain soil organic matter and avoid severe surface erosion.

POTENTIAL WILDLIFE HABITAT - This landtype is rated low for potential summer habitat due to high insolation rates and lack of water. Winter habitat potential is rated moderate at low elevations where the snow accumulation does not limit access.



LANDTYPE 60-U61



SUMMARY

Number of map delineations - 18
Total acreage - 1,700
Average map unit acreage - 94

These units are located on high elevation, cool aspect, nondissected stream breaklands. Soils are deep, well drained, and developed in undifferentiated parent material. Vegetation consists of brush and shrubs with scattered timber.

LANDFORM 60 NONDISSECTED STREAM BREAKLANDS

Overall relief consists of nondissected or weakly dissected stream breaklands which occur adjacent to actively downcutting streams.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 4,800 to 6,000 feet
- B. Slope Gradient - Predominantly greater than 60%
- C. Slope Shape - Straight to concave both vertically and horizontally
- D. Overall Relief - Variable up to 3,000 feet
- E. Dissection Spacing - 500 to 2,500 feet averaging 1,300 feet
- F. Dissection Relief - 10 to 75 feet
- G. Dissection Density - 1 to 10 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Coarse parallel

STREAM DENSITY: 2-7 miles/mile²
MEAN: 4 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (70%)

CHANNEL TYPE: Weakly entrenched over hard bedrock, low width/depth ratio, high energy, bedrock controlled with nick points, ungraded, stable.

SLOPE WATER MOVEMENT: Primarily subsurface flows with moderately rapid downslope movement in permeable soils overlying hard, but fractured bedrock.

SEDIMENT DELIVERY: Slopes and channels are highly efficient with low storage capacity.

OTHER IMPORTANT CHARACTERISTICS:

PARENT MATERIAL GROUP

This group consists of undifferentiated bedrock. The lithologic type does not influence basic interpretive criteria.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations above 4,800 feet on low energy slopes. Soils are 60+ inches deep. Surface soil is darkened, modified volcanic ash 6 to 16 inches thick. Subsurface soil is coarse textured with 20 to 60% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 12" very dark brown or brown silt loam with weak granular structure, nonsticky, nonplastic, (range 6 to 16" thick).

Subsoil - 12 to 38" brown gravelly sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 20 to 60% rock fragments, (range 10 to 30" thick).

Substratum - 38 to 60"+ pale brown gravelly sandy loam, structureless, nonsticky, nonplastic, 30 to 60% rock fragments.

SOIL CLASSIFICATION - Andic Cryumbrepts, loamy-skeletal, mixed, and Andic Cryochrepts, loamy-skeletal, mixed.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - This unit may have high water tables in early spring during snowmelt, but these are not common. The soils in this unit are approximately 70% skeletal and 30% nonskeletal.

VEGETATIVE CHARACTERISTICS - Brush and shrub vegetation is uniform and dense over the unit. Timber is scattered with low basal area and does not occur in clumps.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a high sediment delivery efficiency. Other ratings are low to moderate.

ENGINEERING - Potential road construction problems include a high sediment delivery efficiency. Moderate sources of sediment are debris avalanche mass wasting and subsoil erosion. Brush encroachment is a maintenance problem.

SILVICULTURE - Major silvicultural limitations are severe brush competition and dark colored umbric soils. Basal area stockability may be a major limitation.

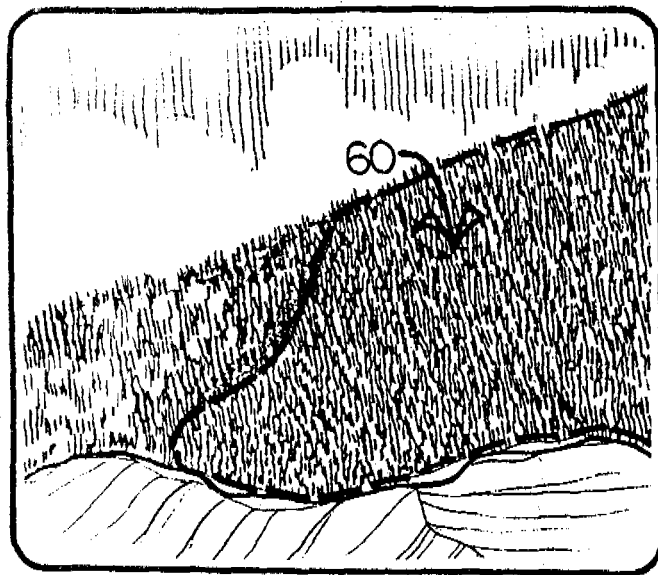
POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate in potential for summer habitat and low for winter habitat due to inaccessibility.



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LANDTYPE 60-U66



SUMMARY

Number of map delineations - 40
Total acreage - 3,600
Average map unit acreage - 90

These units are located on high elevation, cool aspect, nondissected stream breaklands. Soils are deep, well drained, and developed in undifferentiated parent material. The habitat type is subalpine fir/menziesia.

LANDFORM 60 NONDISSECTED STREAM BREAKLANDS

Overall relief consists of nondissected or weakly dissected stream breaklands which occur adjacent to actively downcutting streams.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 5,400 to 6,000 feet
- B. Slope Gradient - Predominantly greater than 60%
- C. Slope Shape - Straight to concave both vertically and horizontally
- D. Overall Relief - Variable up to 3,000 feet
- E. Dissection Spacing - 500 to 2,500 feet averaging 1,300 feet
- F. Dissection Relief - 10 to 75 feet
- G. Dissection Density - 1 to 10 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Coarse parallel

STREAM DENSITY: 2-7 miles/mile²
MEAN: 4 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (70%)

CHANNEL TYPE: Weakly entrenched over hard bedrock, low width/depth ratio, high energy, bedrock controlled with nick points, ungraded, stable.

SLOPE WATER MOVEMENT: Primarily subsurface flows with moderately rapid downslope movement in permeable soils overlying hard, but fractured bedrock.

SEDIMENT DELIVERY: Slopes and channels are highly efficient with low storage capacity.

PARENT MATERIAL GROUP

This group consists of undifferentiated bedrock. Lithologic type does not influence basic interpretive criteria.



SOIL-VEGETATIVE UNIT

This unit occurs at elevations above 5,400 feet on low energy slopes. Soils are 60+ inches deep. Surface soil is volcanic ash 9 to 20 inches thick. Subsurface soil is coarse textured with 20 to 60% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 14" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 9 to 20" thick).

Subsoil - 14 to 32" brown gravelly sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 20 to 60% rock fragments, (range 7 to 28" thick).

Substratum - 32 to 60"+ pale brown gravelly sandy loam, structureless, nonsticky, nonplastic, 30 to 60% rock fragments.

SOIL CLASSIFICATION - Entic Cryandepts, medial/loamy-skeletal, mixed, and Andic Cryochrepts, loamy-skeletal, mixed.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Umbric soils with dark colored surface horizons are common inclusions. A thin (2 to 5") A1 surface horizon is common to this mapping unit. The soils in this unit are approximately 70% skeletal and 30% nonskeletal.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is subalpine fir/menziesia (ABLA/MEFE). Lower elevation units grade into subalpine fir/pachistima (ABLA/PAMY).

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a high sediment delivery efficiency. Other ratings are low to moderate. This is a relatively stable breakland unit.

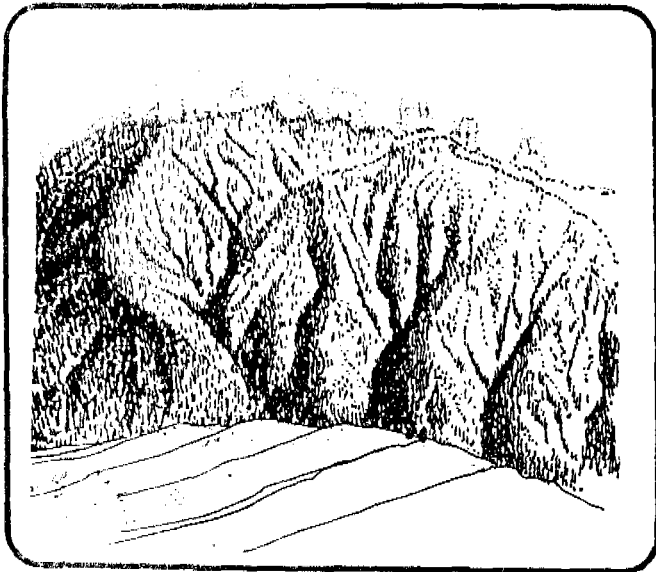
ENGINEERING - Potential road construction problems include a high sediment delivery efficiency. Moderate sources of sediment are debris avalanche mass wasting and subsoil erosion. Brush encroachment is a maintenance problem.

SILVICULTURE - The major silvicultural limitation is severe brush competition.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate in potential for summer habitat and low for winter habitat due to inaccessibility.



LANDTYPE 61-G10



SUMMARY

Number of map delineations - 296
Total acreage - 30,600
Average map unit acreage - 103

These units are located on low elevation, cool aspect, dissected stream breaklands. Soils are deep, well drained, and developed in granitic parent material. The habitat type is western red cedar/pachistima.

LANDFORM 61-DISSECTED STREAM BREAKLANDS

Overall relief consists of very steep dissected stream breaklands which occur adjacent to actively downcutting streams. Dissections occupy at least 25% of the landform.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 1,600 to 4,800 feet
- B. Slope Gradient - Predominately 60+%
- C. Slope Shape - Straight to concave both vertically and horizontally
- D. Overall Relief - Variable up to 3,000 feet
- E. Dissection Spacing - 300 to 1,200 feet averaging 600 feet
- F. Dissection Relief - 50 to 250 feet
- G. Dissection Density - About 10 to 20 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Medium texture parallel

STREAM DENSITY: 3-7 miles/mile²
MEAN: 5 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (90%)

CHANNEL TYPE: Well entrenched with bedrock control, low width/depth ratio, steep high energy with nick points.

SLOPE WATER MOVEMENT: Subsurface with rapid movement along bedrock, soil mantle interface. Subsurface concentrations in draw heads and lower slope margins.

SEDIMENT DELIVERY: Slopes and channels are highly efficient with low sediment storage capacity.

PARENT MATERIAL GROUP

This group consists of moderate to weakly weathered granites and associated gneisses of the Idaho Batholith.



SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,800 feet on low energy slopes. Soils are 60+ inches deep. Surface soil is volcanic ash 12 to 24" inches thick. Subsurface soil is coarse textured with 20 to 60% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 16" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 12 to 24" thick).

Subsoil - 16 to 36" brown gravelly sandy loam with granular structure, nonsticky, nonplastic, 20 to 50% coarse fragments, (range 10 to 30" thick).

Substratum - 36 to 60"+ pale brown gravelly sandy loam, structureless, nonsticky, nonplastic, 20 to 60% coarse fragments.

SOIL CLASSIFICATION - Typic Vitrandepts, medial/loamy, mixed, frigid, and Andic Dystrochrepts, loamy-skeletal, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Variations are limited to ash surface mixing in areas of active colluvial movement and degree of parent material weathering.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is western red cedar/pachistima (THPL/PAMY).

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect very high delivery efficiencies and a high mass wasting potential. Other ratings are low to moderate.

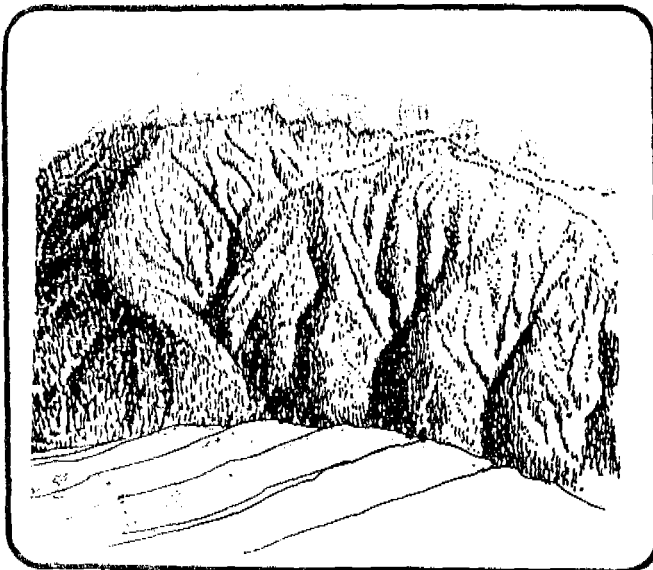
ENGINEERING - Potential road construction problems include a high mass wasting potential and a very high risk of sediment being delivered to streams. Rock falls are a common maintenance problem.

SILVICULTURE - This landtype has no major silvicultural limitations.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate for both winter and summer habitat. The winter habitat rating applies only to low elevations where snow accumulations do not limit access.



LANDTYPE 61-G20



SUMMARY

Number of map delineations - 284
Total acreage - 36,000
Average map unit acreage - 126

These units are located on low elevation, warm aspect, dissected stream breaklands. Soils are deep, well drained, and developed in granitic parent material. The habitat type is western red cedar/pachistima.

LANDFORM 61-DISSECTED STREAM BREAKLANDS

Overall relief consists of very steep dissected stream breaklands which occur adjacent to actively downcutting streams. Dissections occupy at least 25% of the landform.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 1,600 to 4,800 feet
- B. Slope Gradient - Predominately 60+%
- C. Slope Shape - Straight to concave both vertically and horizontally
- D. Overall Relief - Variable up to 3,000 feet
- E. Dissection Spacing - 300 to 1,200 feet averaging 600 feet
- F. Dissection Relief - 50 to 250 feet
- G. Dissection Density - About 10 to 20 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Medium texture parallel

STREAM DENSITY: 3-7 miles/mile²
MEAN: 5 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (20%)

CHANNEL TYPE: Well entrenched with bedrock control, low width/depth ratio, steep high energy with nick points.

SLOPE WATER MOVEMENT: Subsurface with rapid movement along bedrock, soil mantle interface. Subsurface concentrations in draw heads and lower slope margins.

SEDIMENT DELIVERY: Slopes and channels are highly efficient with low sediment storage capacity.

PARENT MATERIAL GROUP

This group consists of moderately weathered granites and associated gneisses of the Idaho Batholith.



SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,800 feet on low energy slopes. Soils are 60+ inches deep. Surface soil is volcanic ash 7 to 22 inches thick. Subsurface soil is coarse textured with 20 to 60% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 12" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 7 to 22" thick).

Subsoil - 12 to 36" brown gravelly sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 20 to 50% rock fragments. (range 10 to 35" thick).

Substratum - 36 to 60"+ pale brown gravelly sandy loam, structureless, nonsticky, nonplastic, 20 to 60% rock fragments.

SOIL CLASSIFICATION - Andic Dystrachrepts, loamy-skeletal, mixed, frigid, and Typic Vitrandepts, medial/loamy, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Variations are limited to ash cap mixing in areas of colluvial movement and degree of parent material weathering. Shallow (lithic) soils may occur in association with rock outcrops. Approximately 60% of the soils in this unit are skeletal, and 40% are nonskeletal.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is western red cedar/pachistima (THPL/PAMY). Grand fir/pachistima (ABGR/PAMY) occurs on drier ridges and points.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a very high sediment delivery efficiency and a high mass wasting potential. Other ratings are low to moderate.

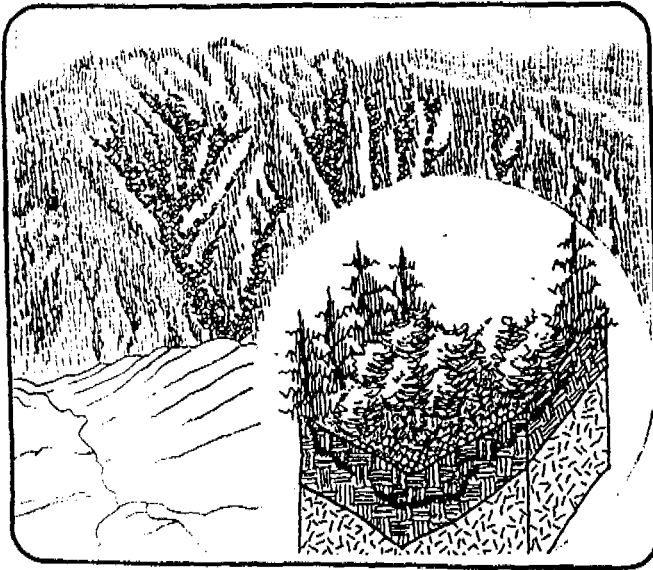
ENGINEERING - Potential road construction problems include a high mass wasting potential, debris avalanche potential, and a very high risk of sediment being delivered to streams. Dry cutbank raveling is a maintenance problem. The revegetation of cut and fill slopes is difficult.

SILVICULTURE - The high insolation rate is a major silvicultural limitation for this landtype.

POTENTIAL WILDLIFE HABITAT - This landtype is rated low for potential summer habitat due to high insolation rates and lack of diversity. Winter habitat potential is rated moderate for those low elevations where snow depths do not limit access.



LANDTYPE 61-G44



SUMMARY

Number of map delineations - 45
Total acreage - 3,100
Average map unit acreage - 68

These units are located on low elevation, dissected stream breaklands. Soils are well drained on ridges, poorly drained in stringer areas, and have deep profiles developed in granitic parent material. The habitat type is western red cedar/pachistima with riparian vegetation in wet stringer areas.

LANDFORM 61-DISSECTED STREAM BREAKLANDS

Overall relief consists of very steep dissected stream breaklands which occur adjacent to actively downcutting streams. Dissections occupy at least 25% of the landform.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 3,000 to 4,800 feet
- B. Slope Gradient - Predominately 60+%
- C. Slope Shape - Straight to concave both vertically and horizontally
- D. Overall Relief - Variable up to 3,000 feet
- E. Dissection Spacing - 300 to 1,200 feet averaging 600 feet
- F. Dissection Relief - 50 to 250 feet
- G. Dissection Density - About 10 to 20 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Medium texture parallel

STREAM DENSITY: 3-7 miles/mile²
MEAN: 5 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (90%)

CHANNEL TYPE: Well entrenched, low width/depth ratio, high energy, running through colluvial material, but bedrock controlled with nick points.

SLOPE WATER MOVEMENT: Mostly subsurface with seeps and springs and perched water tables occurring between dissections with live streams in dissections.

SEDIMENT DELIVERY: Slopes are highly efficient, low storage capacity.

PARENT MATERIAL GROUP

This group consists of granites and gneisses from the Idaho Batholith.



SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,800 feet on all aspect slopes. Soil profiles are 60+ inches deep. Well drained ridge soils have a volcanic ash surface 8 to 16 inches thick. Poorly drained wet stringer soils have a darkened, modified volcanic ash surface 6 to 18 inches thick. Surface soil is coarse textured with 20 to 60% rock fragments. Naturally dense fragipan layers may occur in stringers, resulting in perched water.

TYPICAL SOIL PROFILE

(Well drained soil)

Surface Soil - 0 to 14" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 8 to 16" thick).

Subsoil - 14 to 35" brown, gravelly, sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 30 to 40% rock fragments, (range 10 to 30" thick).

Substratum - 35 to 60"+ light brown gravelly sandy loam, structureless, nonsticky, nonplastic, 30 to 40% rock fragments.

(Poorly drained soil)

Surface Soil - 0 to 14" very dark brown silt loam with weak subangular blocky structure, nonsticky, nonplastic, (range 6 to 18" thick).

Subsoil - 14 to 30" dark greyish brown gravelly sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 20 to 60% rock fragments, (range 10 to 30" thick).*

Substratum - 30 to 60"+ pale brown gravelly sandy loam, structureless, nonsticky, nonplastic, 20 to 60% rock fragments.*

*NOTE: These horizons may have a naturally dense (fragipan) layer which can cause perching of water and poor drainage.

SOIL CLASSIFICATION - Typic Vitrandepts, medfal/loamy-skeletal, mixed, frigid; Andic Dystrochrepts, loamy-skeletal, mixed, frigid; and Typic Haplumbrepts, coarse-loamy, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - The soils in this unit are approximately 60% skeletal and 40% nonskeletal.

VEGETATIVE CHARACTERISTICS - The dominant habitat type on well drained sites is western red cedar/pachistima (THPL/PAMY). Poorly drained stringers support alder, fern, and sedge vegetation.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect very high mass wasting potential and delivery efficiencies. Other ratings are low to moderate.

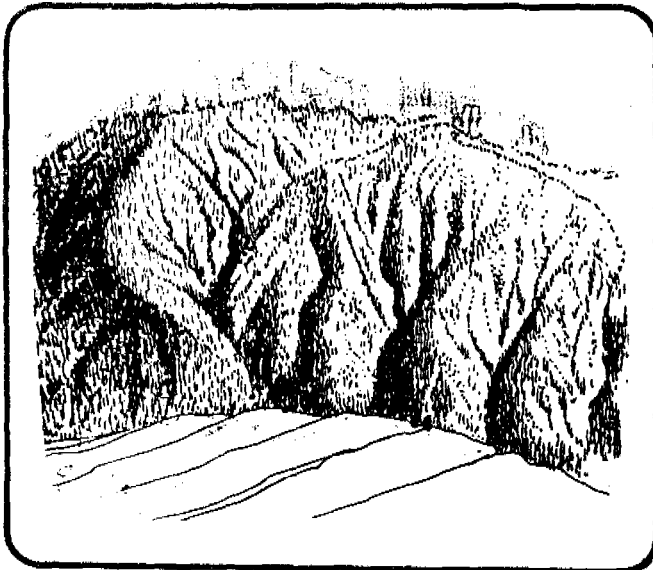
ENGINEERING - Potential road construction problems are associated with wet draws along with a very high mass wasting potential and a very high sediment delivery efficiency. Cutbank and fill sloughing as well as rapid brush encroachment are common maintenance problems.

SILVICULTURE - Silvicultural limitations for this landtype are related to severe brush competition, high water tables, and dark colored umbric soils, all of which are dominant in wet stringer areas. Soil compaction potential is also rated high in wet parts of this unit. Ridges and other well drained portions of this landtype have few silvicultural limitations.

POTENTIAL WILDLIFE HABITAT - This landtype is rated high for potential summer habitat because of the availability of food, water, cover, and diversity. The winter potential is rated low because this unit does not generally occur at low enough elevations where snow does not limit access.



LANDTYPE 61-K10



SUMMARY

Number of map delineations - 32
Total acreage - 2,600
Average map unit acreage - 81

These units are located on low elevation, cool aspect, dissected stream breaklands. Soils are deep, well drained, and are developed in gneissic granitic parent material. The habitat type is western red cedar/pachistima.

LANDFORM 61-DISSECTED STREAM BREAKLANDS

Overall relief consists of very steep dissected stream breaklands which occur adjacent to actively downcutting streams. Dissections occupy at least 25% of the landform.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 2,200 to 4,800 feet
- B. Slope Gradient - Predominately 60+%
- C. Slope Shape - Straight to concave both vertically and horizontally
- D. Overall Relief - Variable up to 3,000 feet
- E. Dissection Spacing - 300 to 1,200 feet averaging 600 feet
- F. Dissection Relief - 50 to 250 feet
- G. Dissection Density - About 10 to 20 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Medium texture parallel

STREAM DENSITY: 3-7 miles/mile²
MEAN: 5 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (80%)

CHANNEL TYPE: Well entrenched with bedrock control, low width/depth ratio, steep high energy with nick points.

SLOPE WATER MOVEMENT: Subsurface with rapid movement along bedrock, soil mantle interface. Subsurface concentrations in draw heads and lower slope margins.

SEDIMENT DELIVERY: Slopes and channels are highly efficient with low sediment storage capacity.

PARENT MATERIAL GROUP

This group consists of deeply weathered, gneissic granitics of the Idaho Batholith. Ash material lies directly over decomposed granitic material with very little soil development and is relatively impermeable.



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SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,800 feet on low energy slopes. Soil profiles are 60+ inches deep. Surface soil is volcanic ash 7 to 20 inches thick. Subsurface soil is coarse textured with 20 to 50% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 14" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 7 to 20" thick).

Subsoil - 14 to 24" brown gravelly sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 20 to 40% pea sized gravels, (range 5 to 25" thick).

Substratum - 24 to 60" pale brown gravelly loamy sand, structureless, nonsticky, nonplastic, 20 to 50% pea sized gravels.

SOIL CLASSIFICATION - Typic Vitrandepts, medial/sandy, mixed, frigid, and Andic Dystrochrepts, Toamy-skeletal, mixed.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Major soil variations are the ash surface horizon depth and degree of ash/subsoil mixing. Colluvial soils with weakly developed IIB horizons occur in moist draws. Soils which support western hemlock may have cryic temperature regimes. This unit contains approximately 60% nonskeletal soils, 40% skeletal soils.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is western red cedar/pachistima (THPL/PAMY). Some units on the Palouse support western hemlock (TSHE/PAMY).

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect very high parent material erosion potential and slope delivery efficiencies. Mass wasting and subsoil erosion potentials are rated high. Sediment control should be a major watershed management objective.

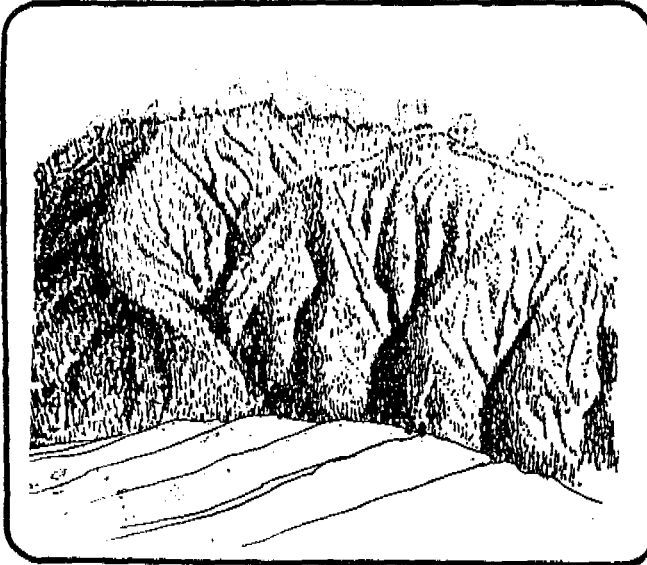
ENGINEERING - Potential road construction problems include a very high erosion rate in the excavated road prism and a high mass wasting hazard with a very high risk of sediment being delivered to streams. Dry cutbank raveling is a maintenance problem.

SILVICULTURE - This landtype has no major silvicultural limitations. To maintain the moisture holding and nutrient supplying capacity of the volcanic ash topsoil, cable logging systems should use high lead or full suspension to avoid surface damage.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate in potential for both summer and winter habitat. The winter rating applies only to low elevations where snow depths do not limit access.



LANDTYPE 61-K20



SUMMARY

Number of map delineations - 33
Total acreage - 2,700
Average map unit acreage - 82

These units are located on low elevation, warm aspect, dissected stream breaklands. Soils are deep, well drained, and are developed in gneissic granitic parent material. The habitat type is western red cedar/pachistima.

LANDFORM 61-DISSECTED STREAM BREAKLANDS

Overall relief consists of very steep dissected stream breaklands which occur adjacent to actively downcutting streams. Dissections occupy at least 25% of the landform.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 2,000 to 4,800 feet
- B. Slope Gradient - Predominately 60+%
- C. Slope Shape - Straight to concave both vertically and horizontally
- D. Overall Relief - Variable up to 3,000 feet
- E. Dissection Spacing - 300 to 1,200 feet averaging 600 feet
- F. Dissection Relief - 50 to 250 feet
- G. Dissection Density - About 10 to 20 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Medium texture parallel

STREAM DENSITY: 3-7 miles/mile²
MEAN: 5 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (90%)

CHANNEL TYPE: Well entrenched with bedrock control, low width/depth ratio, steep high energy with nick points.

SLOPE WATER MOVEMENT: Subsurface with rapid movement along bedrock, soil mantle interface. Subsurface concentrations in draw heads and lower slope margins.

SEDIMENT DELIVERY: Slopes and channels are highly efficient with low sediment storage capacity.

PARENT MATERIAL GROUP

This group consists of deeply weathered gneissic granitics of the Idaho Batholith. Ash material lies directly above decomposed granitic material with very little soil development and is relatively impermeable.



SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,800 feet on high energy slopes. Soil profiles are 60+ inches deep. Surface soil is volcanic ash 5 to 12 inches thick. Subsurface soil is coarse textured with 20 to 50% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 9" dark brown silt loam to sandy loam with weak granular structure, nonsticky, nonplastic, (range 5 to 12" thick).

Subsoil - 9 to 25" brown gravelly sandy loam, loamy sand with weak subangular blocky structure, nonsticky, nonplastic, 20 to 50% pea sized gravels, (range 10 to 25" thick).

Substratum - 25 to 60"+ pale brown gravelly loamy sand, structureless, nonsticky, nonplastic, 20 to 50% pea sized gravels.

SOIL CLASSIFICATION - Andic Dystrochrepts, sandy, mixed, frigid, and Typic Dystrochrepts, loamy-skeletal, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Major soil variations are the ash surface horizon depth and the degree of ash subsoil mixing. Deep colluvial soils with weakly developed IIB horizons with sandy loam textures occur in moist draws. Approximately 65% of these units are nonskeletal, and 35% are skeletal.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is western red cedar/pachistima (THPL/PAMY), with grand fir/pachistima (ABGR/PAMY) on drier ridges.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a very high sediment delivery efficiency and parent material erosion potential. Mass wasting, debris avalanche, and subsoil erosion potentials are rated high. Sediment control should be a major watershed management objective.

ENGINEERING - Potential road construction problems include a very high erosion rate in the excavated road prism, a high debris avalanche hazard, and a high mass wasting hazard. There is a very high risk of sediment from these sources being delivered to streams. Dry cutbank raveling is a maintenance problem.

SILVICULTURE - This landtype has silvicultural limitations related to high insolation rates. Volcanic ash topsoil should be protected during cable skidding operations by using high lead or full suspension systems.

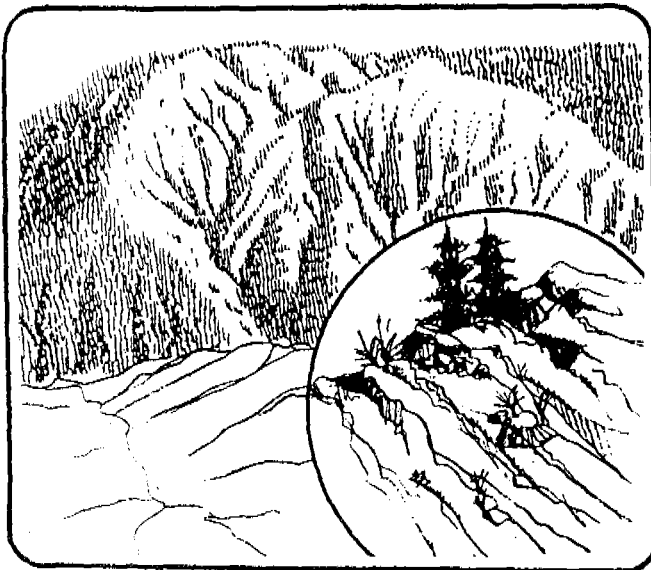
POTENTIAL WILDLIFE HABITAT - This landtype is rated low for potential summer habitat and moderate for winter habitat. The summer rating is low due to high insolation rates and lack of diversity.



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LANDTYPE 61-K30



SUMMARY

Number of map delineations - 13
Total acreage - 600
Average map unit acreage - 45

These units are located on low elevation, warm aspect, dissected stream breaklands. Soil depths are variable, excessively drained, and are developed in gneissic granitic parent material. The habitat types are grand fir/pachistima and Douglas-fir/ninebark. Rock outcrop comprises 10 to 25% of this unit.

LANDFORM 61-DISSECTED STREAM BREAKLANDS

Overall relief consists of very steep dissected stream breaklands which occur adjacent to actively downcutting streams. Dissections occupy at least 25% of the landform.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 2,000 to 5,000 feet
- B. Slope Gradient - Predominately 60+%
- C. Slope Shape - Straight to concave both vertically and horizontally
- D. Overall Relief - Variable up to 3,000 feet
- E. Dissection Spacing - 300 to 1,200 feet averaging 600 feet
- F. Dissection Relief - 50 to 250 feet
- G. Dissection Density - About 10 to 20 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Medium texture parallel

STREAM DENSITY: 2-7 miles/mile²
MEAN: 4 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (80%)

CHANNEL TYPE: Well entrenched over hard bedrock with nick points, low width/depth, high energy, ungraded, stable.

SLOPE WATER MOVEMENT: Overland flow is common on those portions of the unit with thin soils. Runoff is rapid, flashy, and not well regulated.

SEDIMENT DELIVERY: Very efficient with low storage capacity.

PARENT MATERIAL GROUP

This group consists of deeply weathered gneissic granitics of the Idaho Batholith. Surface soil lies directly over decomposed granitic material with very little soil development and is relatively impermeable. Rock outcrop comprises 10 to 25% of this unit.



SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 5,000 feet on high energy slopes. Soil profiles are 20 to 48 inches deep and are droughty. Surface soil is highly mixed volcanic ash 0 to 10 inches thick. Subsurface soil is coarse textured with 40 to 60% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 4" yellowish brown gravelly sandy loam, weak granular structure, nonsticky, nonplastic, 15 to 25% rock fragments, (range 0 to 10" thick).

Subsoil/Substratum - 4 to 20"+ pale brown very gravelly loamy sand, weak subangular blocky structure-structureless, nonsticky, nonplastic, 50 to 60% rock fragments, (range 10 to 38" thick).

SOIL CLASSIFICATION - Dystric Xerochrepts, sandy-skeletal, mixed, frigid, rock outcrop.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Soil surface horizons are variable in depth and composition. Ash is thin and mixed or missing. Soils in this unit are approximately 80% skeletal and 20% nonskeletal. Deeper soils are in draws and thinner soils on ridges and interfluvies.

VEGETATIVE CHARACTERISTICS - The dominant habitat types are grand fir/pachistima (ABGR/PAMY) and Douglas-fir/riñebark (PSME/PHMA).

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect very high parent material erosion and sediment delivery efficiency. Debris avalanche, surface soil, and subsoil erosion hazards are high. Sediment control should be a major watershed management objective.

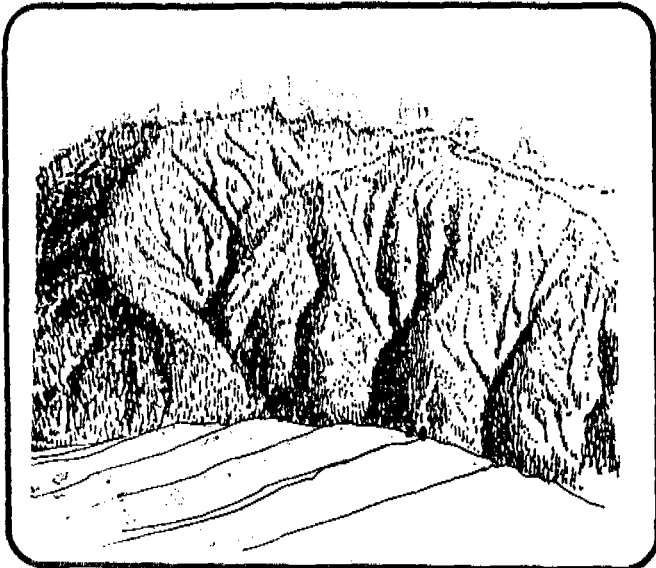
ENGINEERING - Potential road construction problems include a very high erosion rate in the excavated road prism, and a high debris avalanche hazard together with a very high risk of sediment being delivered to streams. Dry cutbank raveling is a maintenance problem.

SILVICULTURE - This landtype has silvicultural limitations related to shallow ash surfaces, high surface rock percentages and high insolation rates. Prescribed burning on this landtype should be of low intensity to minimize soil erosion and organic matter removal.

POTENTIAL WILDLIFE HABITAT - This landtype is rated low for summer range because of high insolation rates and lack of water. Winter habitat potential is rated moderate at low elevations where snow depths do not limit access.



LANDTYPE 61-Q10



SUMMARY

Number of map delineations - 49
Total acreage - 11,700
Average map unit acreage - 239

These units are located on low elevation, cool aspect, dissected stream breaklands. Soils are deep, well drained, and are developed in Belt quartz rich parent material. The habitat type is western red cedar/pachistima.

LANDFORM 61-DISSECTED STREAM BREAKLANDS

Overall relief consists of very steep dissected stream breaklands which occur adjacent to actively downcutting streams. Dissections occupy at least 25% of the landform.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 3,000 to 4,800 feet
- B. Slope Gradient - Predominately 60+%
- C. Slope Shape - Straight to concave both vertically and horizontally
- D. Overall Relief - Variable up to 3,000 feet
- E. Dissection Spacing - 300 to 1,200 feet averaging 600 feet
- F. Dissection Relief - 50 to 250 feet
- G. Dissection Density - About 10 to 20 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Medium texture parallel

STREAM DENSITY: 3-7 miles/mile²
MEAN: 5 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (80%)

CHANNEL TYPE: Well entrenched with bedrock control, low width/depth ratio, steep high energy with nick points.

SLOPE WATER MOVEMENT: Subsurface with rapid movement along bedrock, soil mantle interface. Subsurface concentrations in draw heads and lower slope margins.

SEDIMENT DELIVERY: Slopes and channels are highly efficient with low sediment storage capacity.

PARENT MATERIAL GROUP

This group consists of weakly weathered quartzites, argillites, siltites, and quartz-rich gneiss of the Belt Formation of sedimentary rocks, exclusive of the Revett Formation.



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SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,800 feet on low energy slopes. Soil profiles are 60+ inches deep. Surface soil is volcanic ash 9 to 22 inches thick. Subsurface soil is coarse textured with 20 to 60% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 15" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 9 to 22" thick).

Subsoil - 15 to 31" brown gravelly fine sandy loam to silt loam with weak subangular blocky structure, nonsticky, nonplastic, 20 to 45% rock fragments, (range 10 to 36" thick).

Substratum - 31 to 60" + pale brown gravelly sandy loam, structureless, nonsticky, nonplastic, 20 to 60% rock fragments.

SOIL CLASSIFICATION - Typic Vitrandepts, medial/loamy-skeletal, mixed, frigid, and Andic Dystrachrepts, loamy-skeletal, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Ash surface layers vary in depth and amount of mixing with subsurface layer. The thin and highly mixed ash caps tend to occur on ridge points and upper southerly slopes. Coarse fragment content is variable. Sandy loam subsoil textures are associated with quartzite while silt loam textures are associated with argillites and siltites. Approximately 85% of the soils in this unit are skeletal and 15% are nonskeletal.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is western red cedar/pachistima (THPL/PAMY). Western hemlock/pachistima (TSME/PAMY) occurs on the Palouse.

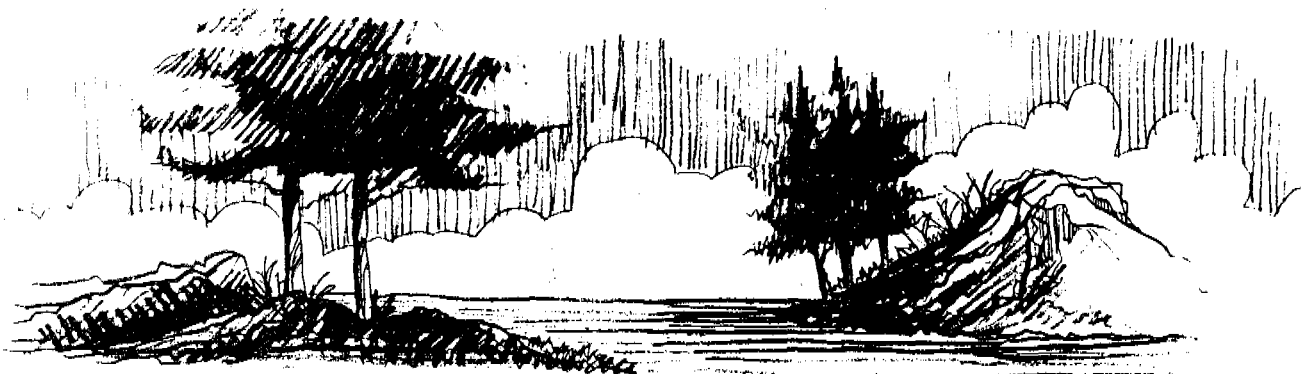
MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a very high sediment delivery efficiency and a high mass wasting potential. Other ratings are low to moderate. This is a relatively stable breakland unit.

ENGINEERING - Potential road construction problems include a very high sediment delivery efficiency. Moderate sources of sediment are mass wasting, debris avalanche, and subsoil erosion. Rock falls are a common maintenance problem.

SILVICULTURE - This landtype has no major silvicultural limitations.

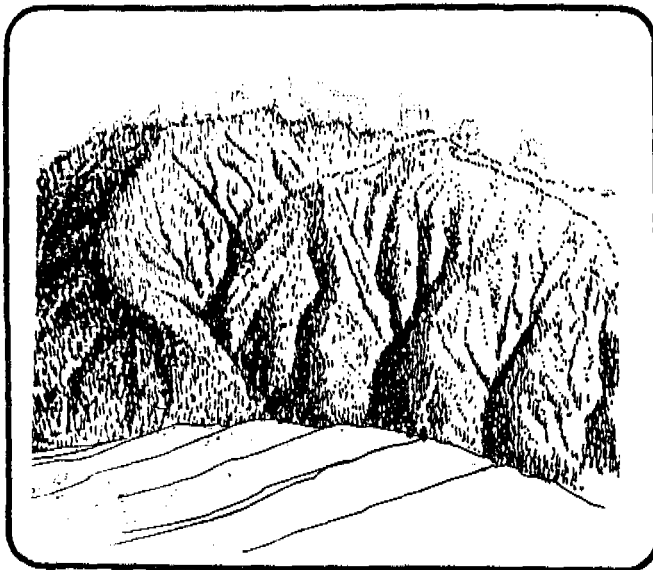
POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate in potential for both summer and winter habitat. The winter rating applies only to low elevations where snow depths do not limit access.



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LANDTYPE 61-Q20



SUMMARY

Number of map delineations - 41
Total acreage - 7,400
Average map unit acreage - 180

These units are located on low elevation, warm aspect, dissected stream breaklands. Soils are deep, well drained, and are developed in Belt formation of quartz rich parent material. The habitat type is western red cedar/pachistima.

LANDFORM 61-DISSECTED STREAM BREAKLANDS

Overall relief consists of very steep dissected stream breaklands which occur adjacent to actively downcutting streams. Dissections occupy at least 25% of the landform.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 2,000 to 4,800 feet
- B. Slope Gradient - Predominately 60+
- C. Slope Shape - Straight to concave both vertically and horizontally
- D. Overall Relief - Variable up to 3,000 feet
- E. Dissection Spacing - 300 to 1,200 feet averaging 600 feet
- F. Dissection Relief - 50 to 250 feet
- G. Dissection Density - About 10 to 20 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Medium texture parallel

STREAM DENSITY: 3-7 miles/mile²
MEAN: 5 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (80%)

CHANNEL TYPE: Well entrenched with bedrock control, low width/depth ratio, steep high energy with nick points.

SLOPE WATER MOVEMENT: Subsurface with rapid movement along bedrock, soil mantle interface. Subsurface concentrations in draw heads and lower slope margins.

SEDIMENT DELIVERY: Slopes and channels are highly efficient with low sediment storage capacity.

PARENT MATERIAL GROUP

This group consists of weakly weathered quartzites, argillites, siltites, and quartz-rich gneisses of the Belt Supergroup Formation, exclusive of the Revett Formation.



SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,800 feet on high energy slopes. Soil profiles are 60+ inches deep. Surface soil is volcanic ash 7 to 18 inches thick. Subsurface soil is coarse textured with 20 to 60% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 13" dark brown silt loam with weak, granular structure, nonsticky, nonplastic, (range 9 to 18" thick).

Subsoil - 13 to 32" brown gravelly sandy loam with weak, subangular blocky structure, nonsticky, nonplastic, 20 to 60% rock fragments, (range 10 to 30" thick).

Substratum - 32 to 60"+ pale brown very gravelly sandy loam, structureless, nonsticky, nonplastic, 20 to 60% rock fragments.

SOIL CLASSIFICATION - Andic Dystrachrepts, loamy-skeletal, mixed, frigid, and Typic Vitrandepts, medial/loamy-skeletal, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Most common inclusions are shallow (lithic - <20") generally being thinner on south to west facing slopes. Wet soils occur along drainages. The soils in this unit are approximately 85% skeletal and 15% nonskeletal.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is western red cedar/pachistima (THPL/PAMY), but on the dry end of the range. Some units have inclusions of grand fir (ABGR/PAMY) on steep south to west facing slopes.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect very high sediment delivery efficiency and a high mass wasting potential. Other ratings are low to moderate. This is a relatively stable breakland unit.

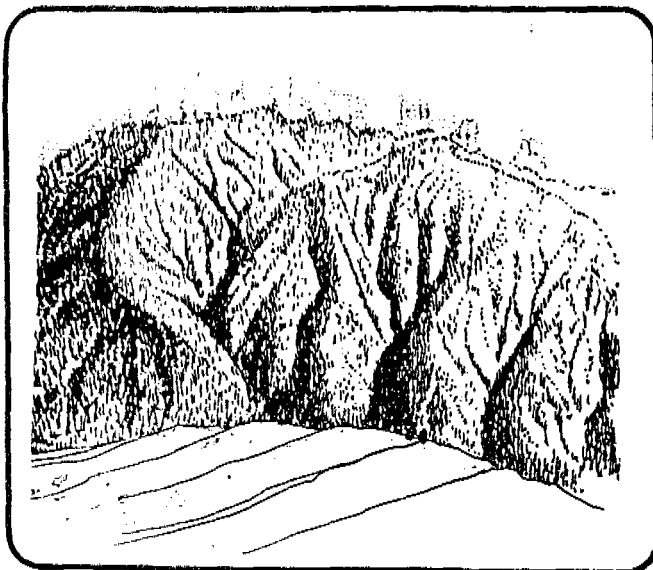
ENGINEERING - Potential road construction problems include a very high sediment delivery efficiency. Moderate sources of sediment are mass wasting, debris avalanche, and subsoil erosion. Dry cutbank raveling and falls are maintenance problems.

SILVICULTURE - A major silvicultural limitation is the high insolation rate.

POTENTIAL WILDLIFE HABITAT - This landtype is rated low for potential summer habitat due to high insolation rates and lack of diversity. Winter habitat is rated moderate at low elevations where snow depth does not limit access.



LANDTYPE 61-R10



SUMMARY

Number of map delineations - 18
Total acreage - 2,700
Average map unit acreage - 150

These units are located on low elevation, cool aspect, dissected stream breaklands. Soils are deep, well drained, and are developed in Revett quartzite parent material. The habitat type is western red cedar/pachistima.

LANDFORM 61-DISSECTED STREAM BREAKLANDS

Overall relief consists of very steep dissected stream breaklands which occur adjacent to actively downcutting streams. Dissections occupy at least 25% of the landform.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 3,000 to 4,800 feet
- B. Slope Gradient - Predominately 60+%
- C. Slope Shape - Straight to concave both vertically and horizontally
- D. Overall Relief - Variable up to 3,000 feet
- E. Dissection Spacing - 300 to 1,200 feet averaging 600 feet
- F. Dissection Relief - 50 to 250 feet
- G. Dissection Density - About 10 to 20 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Medium texture parallel

STREAM DENSITY: 3-7 miles/mile²
MEAN: 5 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (20%)

CHANNEL TYPE: Well entrenched with bedrock control, low width/depth ratio, steep high energy with nick points.

SLOPE WATER MOVEMENT: Subsurface with rapid movement along bedrock, soil mantle interface. Subsurface concentrations in draw heads and lower slope margins.

SEDIMENT DELIVERY: Slopes and channels are highly efficient with low sediment storage capacity.

PARENT MATERIAL GROUP

This group consists of Revett quartzite. This bedrock material is located in the Osier Basin on the Kelly Creek District. This is well weathered quartzite which decomposes rapidly to sand when the rock is exposed to the elements.



SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,800 feet on low energy slopes. Soil profiles are 60+ inches deep. Surface soil is volcanic ash 7 to 18 inches thick. Subsurface soil is medium to coarse textured with 10 to 50% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 14" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 7 to 18" thick).

Subsoil - 14 to 32" brown gravelly fine sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 10 to 35% rock fragments, (range 6 to 35" thick).

Substratum - 32 to 60"+ pale brown gravelly loamy fine sand, structureless, nonsticky, nonplastic, 20 to 50% rock fragments.

SOIL CLASSIFICATION - Typic Vitrandepts, medial/loamy, mixed, frigid, and Andic Dystrochrepts, coarse-loamy, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Major soil variations are ash cap depth and percentage of coarse fragments in subsoils and substratum.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is western red cedar/pachistima.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect very high slope delivery efficiencies. Also rated high are mass wasting, subsoil and parent material erosion potential. Other ratings are low and moderate.

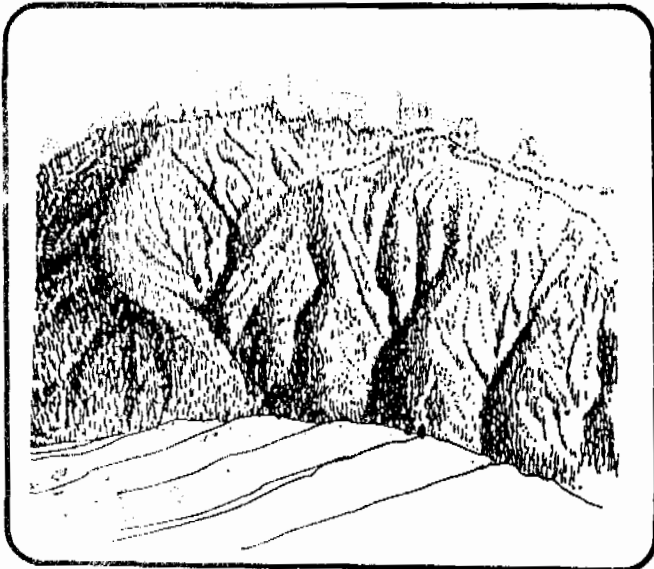
ENGINEERING - Potential road construction problems include a high mass wasting hazard along with high erosion rates in the excavated road prism. There is a very high risk of sediment from these sources being delivered to streams. Cutbank and fill sloughing are maintenance problems.

SILVICULTURE - There are no major silvicultural limitations associated with this landtype.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate in potential for summer habitat. Winter range potential is rated moderate at low elevations where snow accumulation does not limit access.



LANDTYPE 61-R20



SUMMARY

Number of map delineations - 20
Total acreage - 4,900
Average map unit acreage - 246

These units are located on low elevation, warm aspect, dissected stream breaklands. Soils are deep, well drained, and are developed in Revett quartzite parent material. The habitat type is western red cedar/pachistima.

LANDFORM 61-DISSECTED STREAM BREAKLANDS

Overall relief consists of very steep dissected stream breaklands which occur adjacent to actively downcutting streams. Dissections occupy at least 25% of the landform.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 3,000 to 4,800 feet
- B. Slope Gradient - Predominately 60+%
- C. Slope Shape - Straight to concave both vertically and horizontally
- D. Overall Relief - Variable up to 3,000 feet
- E. Dissection Spacing - 300 to 1,200 feet averaging 600 feet
- F. Dissection Relief - 50 to 250 feet
- G. Dissection Density - About 10 to 20 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Medium texture parallel

STREAM DENSITY: 3-7 miles/mile²
MEAN: 5 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (50%)

CHANNEL TYPE: Well entrenched with bedrock control, low width/depth ratio, steep high energy with nick points.

SLOPE WATER MOVEMENT: Subsurface with rapid movement along bedrock, soil mantle interface. Subsurface concentrations in draw heads and lower slope margins.

SEDIMENT DELIVERY: Slopes and channels are highly efficient with low sediment storage capacity.

PARENT MATERIAL GROUP

This group consists of Revett quartzites. This bedrock material is located in the Osier Basin on the Kelly Creek District. This is well weathered quartzite which decomposes rapidly to sand when the rock is exposed to the elements



SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,800 feet on high energy slopes. Soil profiles are 60+ inches deep. Surface soil is volcanic ash 4 to 10 inches thick. Subsurface soil is medium to coarse-textured with 5 to 30% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 8" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 4 to 10" thick).

Subsoils - 8 to 27" brown fine sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 5 to 20% rock fragments, (range 8 to 24" thick).

Substratum - 27 to 60"+ pale brown gravelly fine sandy loam to loamy fine sand, structureless, nonsticky, nonplastic, 15 to 30% rock fragments.

SOIL CLASSIFICATION - Andic Dystrachrepts, coarse-loamy, mixed, frigid, and Typic Dystrachrepts. Coarse-loamy, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - This mapping unit is limited to the Deception area of the Kelly Creek District. The unit occurs on southerly aspects with shallow droughty soil as a common inclusion on ridge points and severe exposures. Major variations are ash cap depth and percentage of coarse fragments in subsoil and substratum.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is western red cedar/pachistima (THPL/PAMY).

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a very high sediment delivery efficiency. Rated high are mass wasting, subsoil erosion, and parent material erosion potentials. Other ratings are low and moderate. This is one of the most unstable landtypes on the Forest.

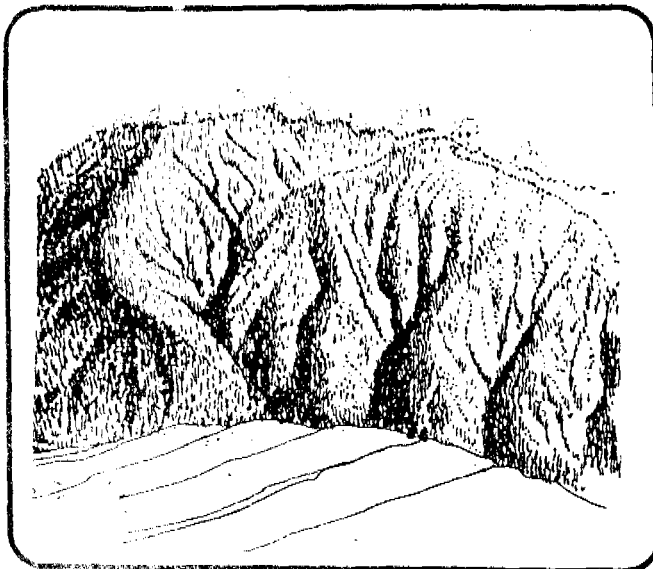
ENGINEERING - Potential road construction problems include high mass wasting and debris avalanche hazards along with high erosion rates in the excavated road prism. There is a very high risk of sediment from these sources being delivered to streams. Cutbank and fill sloughing are maintenance problems.

SILVICULTURE - The major silvicultural limitation for this landtype is the high insolation rate.

POTENTIAL WILDLIFE HABITAT - This land type is rated low for potential summer habitat due to high insolation rates and lack of diversity. Winter habitat is rated moderate at low elevations where snow depths do not limit access.



LANDTYPE 61-S10



SUMMARY

Number of map delineations - 97
Total acreage - 10,000
Average map unit acreage - 103

These units are located on low elevation, cool aspect, dissected stream breaklands. Soils are deep, well drained, and are developed in micaceous schist parent material. The habitat type is western red cedar/pachistima.

LANDFORM 61-DISSECTED STREAM BREAKLANDS

Overall relief consists of very steep dissected stream breaklands which occur adjacent to actively downcutting streams. Dissections occupy at least 25% of the landform.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 1,600 to 4,800 feet
- B. Slope Gradient - Predominately 60+%
- C. Slope Shape - Straight to concave both vertically and horizontally
- D. Overall Relief - Variable up to 3,000 feet
- E. Dissection Spacing - 300 to 1,200 feet averaging 600 feet
- F. Dissection Relief - 50 to 250 feet
- G. Dissection Density - About 10 to 20 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Medium texture parallel

STREAM DENSITY: 3-7 miles/mile²
MEAN: 5 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (80%)

CHANNEL TYPE: Well entrenched with bedrock control, low width/depth ratio, steep high energy with nick points.

SLOPE WATER MOVEMENT: Subsurface with rapid movement along bedrock, soil mantle interface. Subsurface concentrations in draw heads and lower slope margins.

SEDIMENT DELIVERY: Slopes and channels are highly efficient with low sediment storage capacity.

PARENT MATERIAL GROUP

This group consists of micaceous schists and interbedded gneisses. These are Border Zone metamorphic rocks.



SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,800 feet on low energy slopes. Soil profiles are 60+ inches deep. Surface soil is volcanic ash 7 to 22 inches thick. Subsurface soil is coarse textured with 20 to 50% rock fragments and an estimated 10 to 20% mica content.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 14" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 7 to 22" thick).

Subsoil - 14 to 32" brown gravelly sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 20 to 50% rock fragments, (range 10 to 40" thick).

Substratum - 32 to 60"+ pale brown sandy loam, structureless, nonsticky, nonplastic, 20 to 50% rock fragments.

SOIL CLASSIFICATION - Typic Vitrandepts, medial/loamy, mixed, frigid; Andic Dystrochrepts, loamy-skeletal, mixed, frigid; and Eutric Glossoboralfs, fine-loamy, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Ash cap mixing is common on steeper slopes. Shallow soils are associated with rock outcrops. Soils with finer textured subsoils (alfisols) commonly occur in moist draws. Soils in this unit are approximately 50% skeletal and 50% nonskeletal.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is western red cedar/pachistima (THPL/PAMY). Western hemlock types (TSME/PAMY) occur on the Palouse.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect very high mass wasting potential and sediment delivery efficiencies. Other ratings are low to moderate.

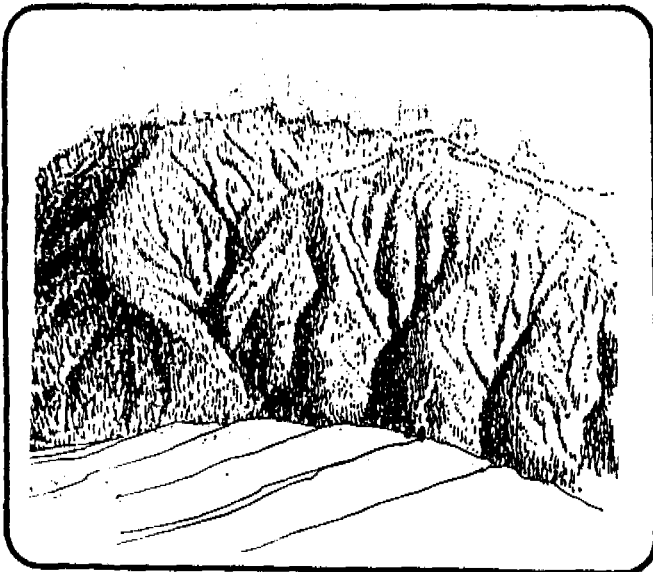
ENGINEERING - Potential road construction problems include a very high mass wasting potential with a very high risk of sediment being delivered to streams. Cutbanks and fill sloughing are maintenance problems.

SILVICULTURE - There are no major silvicultural limitations associated with this landtype.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate for potential summer and winter range.



LANDTYPE 61-S20



SUMMARY

Number of map delineations - 107
Total acreage - 9,200
Average map unit acreage - 86

These units are located on low elevation, warm aspect, dissected stream breaklands. Soils are deep, well drained, and are developed in micaceous schist parent material. The habitat type is western red cedar/pachistima.

LANDFORM 61-DISSECTED STREAM BREAKLANDS

Overall relief consists of very steep dissected stream breaklands which occur adjacent to actively downcutting streams. Dissections occupy at least 25% of the landform.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 1,600 to 4,800 feet
- B. Slope Gradient - Predominately 60+%
- C. Slope Shape - Straight to concave both vertically and horizontally
- D. Overall Relief - Variable up to 3,000 feet
- E. Dissection Spacing - 300 to 1,200 feet averaging 600 feet
- F. Dissection Relief - 50 to 250 feet
- G. Dissection Density - About 10 to 20 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Medium texture parallel

STREAM DENSITY: 3-7 miles/mile²
MEAN: 5 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (80%)

CHANNEL TYPE: Well entrenched with bedrock control, low width/depth ratio, steep high energy with nick points.

SLOPE WATER MOVEMENT: Subsurface with rapid movement along bedrock, soil mantle interface. Subsurface concentrations in draw heads and lower slope margins.

SEDIMENT DELIVERY: Slopes and channels are highly efficient with low sediment storage capacity.

PARENT MATERIAL GROUP

This group consists of micaceous schists and interbedded gneisses.



SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,800 feet on high energy slopes. Soil profiles are 60+ inches deep. Surface soil is volcanic ash 7 to 18 inches thick. Subsurface soil is medium to coarse textured with 20 to 50% rock fragments and an estimated 10 to 20% mica content.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 12" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 7 to 18" thick).

Subsoil - 12 to 25" brown gravelly sandy loam to loam with weak subangular blocky structure, nonplastic, 20 to 50% rock fragments, (range 10 to 30" thick).

Substratum - 25 to 60"+ pale brown gravelly sandy loam, structureless, nonsticky, nonplastic, 20 to 50% rock fragments.

SOIL CLASSIFICATION - Andic Dystrachrepts, loamy-skeletal, mixed, frigid, and Eutric Glossoboralfs, fine-loamy, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Soils with finer textured subsoils (Alfisols) commonly occur in moist draws. Shallow (lithic - 20" deep) soils occur adjacent to bedrock outcrops. This unit contains approximately 50% skeletal soils and 50% nonskeletal soils.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is western red cedar/pachistima (THPL/PAMY).

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a very high mass wasting potential and sediment delivery efficiency.

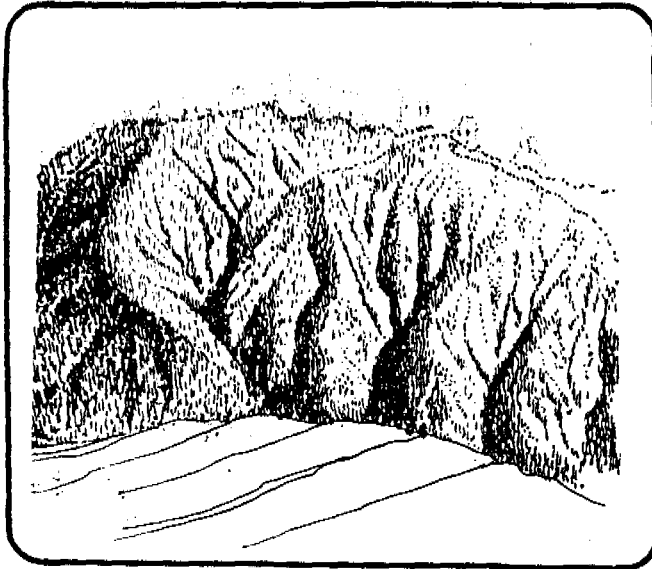
ENGINEERING - Potential road construction problems include a very high mass wasting potential with a very high risk of sediment being delivered to streams. Cutbank and fill sloughing are maintenance problems.

SILVICULTURE - Silvicultural limitations include high insolation rates.

POTENTIAL WILDLIFE HABITAT - This landtype is rated low for potential summer habitat due to high insolation rates and lack of diversity. Where elevations are low enough to be accessible during periods of snow accumulations, winter habitat is rated moderate.



LANDTYPE 61-S26



SUMMARY

Number of map delineations - 83
Total acreage - 10,500
Average map unit acreage - 127

These units are located on low elevation, warm aspect, dissected stream breaklands. Soils are moderately deep, somewhat excessively drained, and developed in micaceous schist parent material. The habitat type is grand fir/pachistima or Douglas-fir/ninebark.

LANDFORM 61-DISSECTED STREAM BREAKLANDS

Overall relief consists of very steep dissected stream breaklands which occur adjacent to actively downcutting streams. Dissections occupy at least 25% of the landform.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 1,600 to 4,800 feet
- B. Slope Gradient - Predominately 60+%
- C. Slope Shape - Straight to concave both vertically and horizontally
- D. Overall Relief - Variable up to 3,000 feet
- E. Dissection Spacing - 300 to 1,200 feet averaging 600 feet
- F. Dissection Relief - 50 to 250 feet
- G. Dissection Density - About 10 to 20 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Medium texture parallel

STREAM DENSITY: 3-7 miles/mile²
MEAN: 5 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (80%)

CHANNEL TYPE: Well entrenched with bedrock control, low width/depth ratio, steep high energy with nick points.

SLOPE WATER MOVEMENT: Subsurface with rapid movement along bedrock, soil mantle interface. Subsurface concentrations in draw heads and lower slope margins.

SEDIMENT DELIVERY: Slopes and channels are highly efficient with low sediment storage capacity.

PARENT MATERIAL GROUP

This group consists of weathered micaceous schists with interbedded gneisses and pegmatites of the Belt Supergroup. These are commonly referred to as the high grade metamorphics of the Border Zone.



SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,800 feet on high energy slopes. Soils are 30 to 48 inches deep and tend to be droughty. Surface soil is mixed volcanic ash 3 to 16 inches thick. Subsurface soil is coarse textured with 20 to 50% rock fragments and an estimated 10 to 20% mica content.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 5" dark brown silt loam to sandy loam with weak granular structure, nonsticky, nonplastic, (range 3 to 16" thick).

Subsoil - 5 to 36" brown gravelly sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 20 to 40% rock fragments, (range 10 to 40" thick).

Substratum - 36 to 48"+ pale brown gravelly sandy loam, structureless, nonsticky, nonplastic, 20 to 50% rock fragments.

SOIL CLASSIFICATION - Andic Dystrichrepts, loamy-skeletal, mixed, frigid, and Dystric Xerochrepts, loamy-skeletal, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Moderate depth, excessively well drained soils occur on ridges with deep well drained soils occurring in draws and swales. Shallow soils (lithic - <20") occur on sharp ridge points and in the vicinity of rock outcrops. Ash caps are usually mixed with and may have sandy loam textures. The soils in this unit are approximately 65% skeletal and 35% nonskeletal.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is grand fir/pachistima (ABGR/PAMY) with Douglas-fir/ninebark occurring on thin dry soils and western red cedar in moist draws and along lower margins of the unit.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect very high mass wasting potential and sediment delivery efficiency. The debris avalanche potential is rated high.

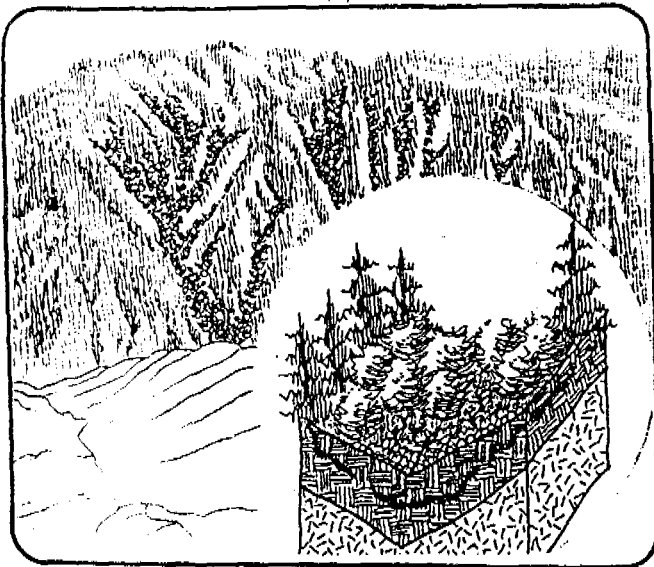
ENGINEERING - Potential road construction problems include high debris avalanche and mass wasting hazards along with subsoil erosion. There is a very high risk of sediment from these sources being delivered to streams. Cutbank sloughing and dry cutbank raveling are maintenance problems.

SILVICULTURE - Silvicultural limitations are related to thin, mixed ash surfaces and high insolation rates. Prescribed fires should be light and cool to maintain soil organic matter and to avoid severe surface erosion.

POTENTIAL WILDLIFE HABITAT - This landtype is rated low for summer habitat due to high insolation rates and lack of water. Potential winter habitat is rated moderate at low elevations where snow depths do not limit access.



LANDTYPE 61-S44



SUMMARY

Number of map delineations - 17
Total acreage - 1,100
Average map unit acreage - 65

These units are located on low elevation, dissected stream breaklands. Soils are well drained on ridges, poorly drained in stringer areas, and have deep profiles developed in micaceous schist parent material. The habitat type is western red cedar/pachistima with riparian vegetation in wet stringer areas.

LANDFORM 61-DISSECTED STREAM BREAKLANDS

Overall relief consists of very steep dissected stream breaklands which occur adjacent to actively downcutting streams. Dissections occupy at least 25% of the landform.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 1,600 to 4,800 feet
- B. Slope Gradient - Predominately 60+%
- C. Slope Shape - Straight to concave both vertically and horizontally
- D. Overall Relief - Variable up to 3,000 feet
- E. Dissection Spacing - 300 to 1,200 feet averaging 600 feet
- F. Dissection Relief - 50 to 250 feet
- G. Dissection Density - About 10 to 20 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Medium texture parallel

STREAM DENSITY: 3-7 miles/mile²
MEAN: 5 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (50%)

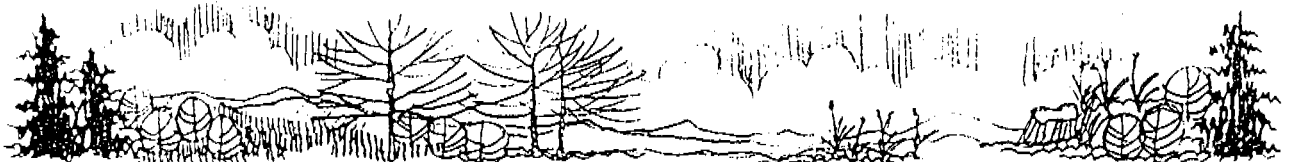
CHANNEL TYPE: Well entrenched, low width/depth ratio, high energy, running through colluvial material, but bedrock controlled with nick points.

SLOPE WATER MOVEMENT: Mostly subsurface with seeps and springs and perched water tables occurring between dissections with live streams in dissections.

SEDIMENT DELIVERY: Slopes are highly efficient, low storage capacity.

PARENT MATERIAL GROUP

This group consists of micaceous schists and gneisses with interbedded pegmatites of the Belt Supergroup. These are commonly referred to as the high grade metamorphics of the Border Zone.



SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,800 feet on all aspect slopes. Soil profiles are 60+ inches deep. Well drained ridge soils have a volcanic ash surface 15 to 20 inches thick. Poorly drained stringer soils have a darkened, modified volcanic ash surface 12 to 20 inches thick. Subsurface soil is medium to coarse textured with 20 to 60% rock fragments and has an estimated 10 to 20% mica content. Naturally dense fragipan layers may occur in stringers, resulting in perched water.

TYPICAL SOIL PROFILES

(Well drained soil)

Surface Soil - 0 to 17" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 15 to 20" thick).

Subsoil - 17 to 37" brown gravelly sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 30 to 60% rock fragments, (range 10 to 30" thick).

Substratum - 37 to 60"+ light brown gravelly sandy loam, structureless, nonsticky, nonplastic, 30 to 60% rock fragments.

(Poorly drained soil)

Surface Soil - 0 to 15" very dark brown silt loam with weak subangular blocky structure, nonsticky, nonplastic, (range 12 to 20" thick).

Subsoil - 15 to 30" dark greyish brown gravelly sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 20 to 50% rock fragments, (range 10 to 30" thick).*

Substratum - 30 to 60"+ pale brown gravelly sandy loam, structureless, nonsticky, nonplastic, 20 to 60% rock fragments.*

*NOTE: These horizons may have a naturally dense (fragipan) characteristic which may perch water and result in poor drainage.

SOIL CLASSIFICATION - Typic Vitrandepts, medial/loamy, mixed, frigid; Andic Dystrachrepts, loamy-skeletal, mixed; and Eutric Glossoboralfs, fine-loamy, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Alfisols may occur in the moist draw and stringer portions of this unit. Up to 15% of this unit occurs above 4,800 feet. Approximately 50% of the soils in this unit are skeletal, 50% are nonskeletal.

VEGETATIVE CHARACTERISTICS - The dominant habitat type in well drained areas is western red cedar/pachistima (THPL/PAMY). Poorly drained draws or stringers have cedar with alder, fern, and sedge understory vegetation. Other conifer species present in mixed forest may include grand fir (ABGR) at lower elevations and subalpine fir (ABLA) or mountain hemlock (TSME) at higher elevations.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a very high mass wasting potential and slope sediment delivery efficiency. Other ratings are low to moderate.

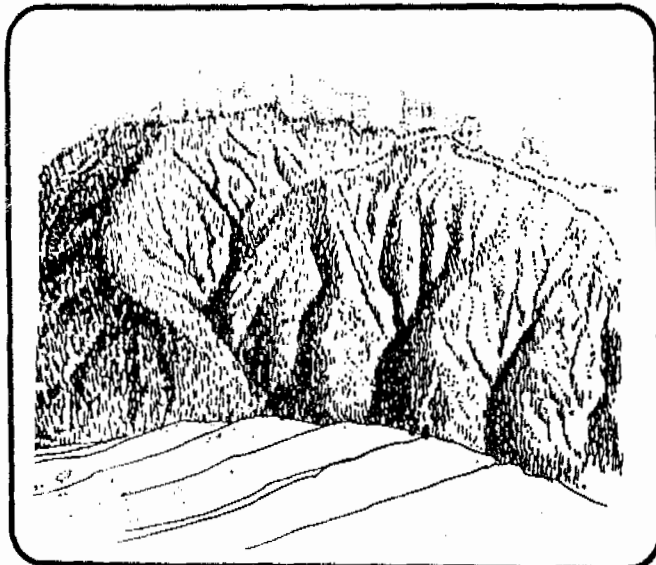
ENGINEERING - Potential road construction problems are associated with wet areas and include a very high mass wasting potential with a very high risk of sediment being delivered to streams. Cutbank and fill sloughing with rapid brush encroachment in wet areas are maintenance problems.

SILVICULTURE - Silvicultural limitations for this landtype are related to severe brush competition, high water tables, and dark colored umbric soils, all of which are dominant in wet stringer areas. Soil compaction potential is also rated high in wet parts of this unit. Ridges and other well drained portions of this landtype have few silvicultural limitations.

POTENTIAL WILDLIFE HABITAT - This landtype is rated high for potential summer habitat because of adequate food, water, cover, and diversity. The winter habitat rating is low because this unit does not generally occur at low elevations when snow depths do not limit access.



LANDTYPE 61-S60



SUMMARY

Number of map delineations - 12
Total acreage - 3,900
Average map unit acreage - 323

These units are located on high elevation, cool aspect, dissected stream breaklands. Soils are deep, well drained, and are developed in micaceous schist parent material. The habitat type is subalpine fir/pachistima.

LANDFORM 61-DISSECTED STREAM BREAKLANDS

Overall relief consists of very steep dissected stream breaklands which occur adjacent to actively downcutting streams. Dissections occupy at least 25% of the landform.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 4,800 to 6,000 feet
- B. Slope Gradient - Predominately 60+%
- C. Slope Shape - Straight to concave both vertically and horizontally
- D. Overall Relief - Variable up to 3,000 feet
- E. Dissection Spacing - 300 to 1,200 feet averaging 600 feet
- F. Dissection Relief - 50 to 250 feet
- G. Dissection Density - About 10 to 20 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Medium texture parallel

STREAM DENSITY: 3-7 miles/mile²
MEAN: 5 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (93%)

CHANNEL TYPE: Well entrenched with bedrock control, low width/depth ratio, steep high energy with nick points.

SLOPE WATER MOVEMENT: Subsurface with rapid movement along bedrock, soil mantle interface. Subsurface concentrations in draw heads and lower slope margins.

SEDIMENT DELIVERY: Slopes and channels are highly efficient with low sediment storage capacity.

PARENT MATERIAL GROUP

This group consists of weak to moderately weathered micaceous schists, gneisses and interbedded pegmatites of the Belt Supergroup, commonly referred to as high grade metamorphics of the Border Zone.



SOIL-VEGETATIVE UNIT

This unit occurs at elevations above 4,800 feet on low energy slopes. Soil profiles are 60+ inches deep. Surface soil is volcanic ash 10 to 20 inches thick. Subsurface soil is medium to coarse textured with 20 to 60% rock fragments and an estimated 10 to 20% mica content.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 15" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 10 to 20" thick).

Subsoil - 15 to 30" brown gravelly sandy loam to loam with weak subangular blocky structure, slightly sticky, nonplastic, 20 to 50% rock fragments, (range 10 to 30" thick).

Substratum - 30 to 60"+ pale brown gravelly sandy loam, structureless, nonsticky, nonplastic, 20 to 60% rock fragments.

SOIL CLASSIFICATION - Andeptic Cryoboralfs, medial/loamy-skeletal, mixed, and Typic Cryandeps, medial/loamy, mixed.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Deep soils with clay accumulation horizons (alfisols) occur in moist draws. Ash caps may be mixed. The soils in this unit are approximately 55% skeletal and 45% nonskeletal.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is subalpine fir/pachistima (ABLA/PAMY).

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a very high sediment delivery efficiency and a high rotational mass wasting potential. Other ratings are low to moderate.

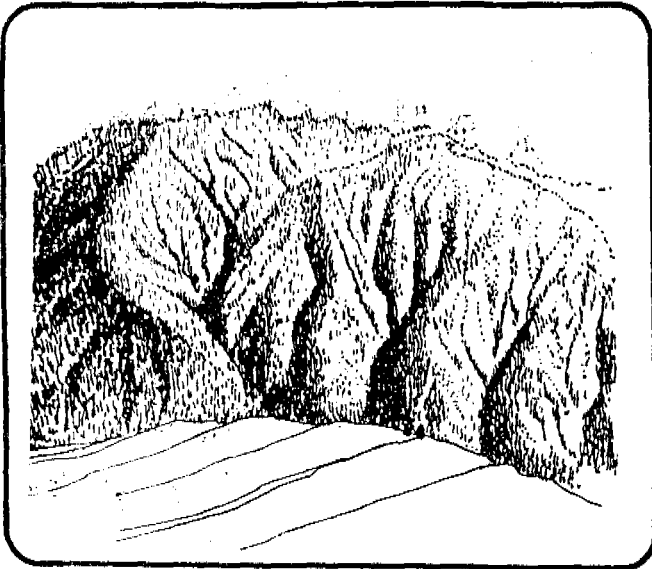
ENGINEERING - Potential road construction problems include a high mass wasting hazard with a very high risk of this sediment being delivered to streams. Cutbank and fill sloughing require maintenance.

SILVICULTURE - This landtype has no major silvicultural limitations.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate for potential summer range and low for winter habitat. The low winter rating is due to this unit occurring at high elevations where snow depths limit access.



LANDTYPE 61-T10



SUMMARY

Number of map delineations - 5
Total acreage - 300
Average map unit acreage - 60

These units are located on low elevation, cool aspect, dissected stream breaklands. Soils are deep, well drained, and are developed in parent material. The habitat type is western red cedar/pachistima.

LANDFORM 61-DISSECTED STREAM BREAKLANDS

Overall relief consists of very steep dissected stream breaklands which occur adjacent to actively downcutting streams. Dissections occupy at least 25% of the landform.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 1,600 to 3,600 feet
- B. Slope Gradient - Predominately 60+%
- C. Slope Shape - Straight to concave both vertically and horizontally
- D. Overall Relief - Variable up to 3,000 feet
- E. Dissection Spacing - 300 to 1,200 feet averaging 600 feet
- F. Dissection Relief - 50 to 250 feet
- G. Dissection Density - About 10 to 20 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Medium texture parallel

STREAM DENSITY: 3-7 miles/mile²
MEAN: 5 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (80%)

CHANNEL TYPE: Well entrenched with bedrock control, low width/depth ratio, steep high energy with nick points.

SLOPE WATER MOVEMENT: Subsurface with rapid movement along bedrock, soil mantle interface. Subsurface concentrations in draw heads and lower slope margins.

SEDIMENT DELIVERY: Slopes and channels are highly efficient with low sediment storage capacity.

PARENT MATERIAL GROUP

This group consists of Columbia River basalt with some influence from Palouse loess, Latah Interbeds, and Mazama volcanic ash.



SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 3,600 feet on low energy slopes. Soil profiles are 60+ inches deep. Surface soil is volcanic ash 10 to 30 inches deep. Subsurface soil is moderately fine textured with 20 to 60% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 16" dark brown silt loam, medium granular structure, very friable, slightly sticky, slightly plastic, (range 10 to 30" thick).

Subsoil (1) - 16 to 32" dark brown silt loam with moderate subangular blocky structure, friable, slightly sticky, slightly plastic, 10 to 25% rock fragments, (range 10 to 40" thick).

Subsoil (2) - 32 to 60"+ dark brown heavy silt loam to clay loam with moderate subangular blocky structure, friable, sticky, plastic with clay films on ped faces, 35 to 90% rock fragments.

Substratum - This soil generally grades into weakly weathered fractured basalt.

SOIL CLASSIFICATION - Eutric Glossoboralf, loamy-skeletal, mixed, thick ash cover phase.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - The above described soil occupies most of this unit but varies in relation to rock fragment content, degree of clay accumulation in subsoil 2, and thickness of volcanic ash. This unit includes 10 to 30% soils which are only shallow to basalt. Rock outcrop comprises about 2% of the unit.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is western red cedar/pachistima (THPL/PAMY) usually on the moist end of the range. There are small inclusions of grand fir/pachistima (ABGR/PAMY) on southwest facing microsites.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a very high sediment delivery efficiency and a high mass wasting potential.

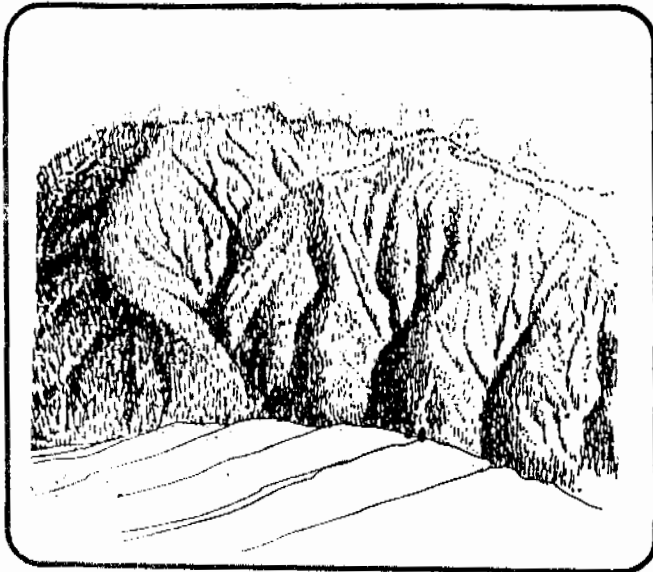
ENGINEERING - Potential road construction problems include a very high sediment delivery efficiency with moderate sources of sediment being mass wasting, debris avalanche, and surface erosion. Cutbank sloughing is a maintenance problem.

SILVICULTURE - These landtypes have no major silvicultural limitations.

POTENTIAL WILDLIFE HABITAT - This landtype is rated as having moderate potential for summer habitat. Winter habitat is rated moderate at lower elevations where snow depths do not limit accessibility.



LANDTYPE 61-T20



SUMMARY

Number of map delineations - 9
Total acreage - 1,800
Average map unit acreage - 200

These units are located on low elevation, warm aspect, dissected stream breaklands. Soils are deep, well drained, and developed in basalt parent material. The habitat type is western red cedar/pachistima.

LANDFORM 61-DISSECTED STREAM BREAKLANDS

Overall relief consists of very steep dissected stream breaklands which occur adjacent to actively downcutting streams. Dissections occupy at least 25% of the landform.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 1,600 to 3,600 feet
- B. Slope Gradient - Predominately 60+%
- C. Slope Shape - Straight to concave both vertically and horizontally
- D. Overall Relief - Variable up to 3,000 feet
- E. Dissection Spacing - 300 to 1,200 feet averaging 600 feet
- F. Dissection Relief - 50 to 250 feet
- G. Dissection Density - About 10 to 20 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Medium texture parallel

STREAM DENSITY: 3-7 miles/mile²
MEAN: 5 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (80%)

CHANNEL TYPE: Well entrenched with bedrock control, low width/depth ratio, steep high energy with nick points.

SLOPE WATER MOVEMENT: Subsurface with rapid movement along bedrock, soil mantle interface. Subsurface concentrations in draw heads and lower slope margins.

SEDIMENT DELIVERY: Slopes and channels are highly efficient with low sediment storage capacity.

PARENT MATERIAL GROUP

This group consists of Columbia River basalts with influence from Palouse loess, Latah Interbeds, and Mazama volcanic ash.



SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 3,600 feet on high energy slopes. Soil profiles are 60+ inches deep, well drained, and rocky. Surface soil is volcanic ash 7 to 18 inches thick. Subsurface soils are very gravelly and moderately fine textured.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 11" dark brown silt loam with weak granular structure, very friable, slightly sticky, slightly plastic, (range 7 to 18" thick).

Subsoil (1) - 11 to 32 inches dark brown silt loam with moderate subangular blocky structure, friable, slightly sticky, slightly plastic, 10 to 25% rock fragments, (range 10 to 40" thick).

Subsoil (2) - 32 to 60"+ dark brown heavy silt loam to clay loam with moderate subangular blocky structure, friable, sticky, plastic, with clay films on ped faces, 40 to 80% rock fragments.

Substratum - The soil generally grades into weakly weathered fractured basalt.

SOIL CLASSIFICATION - Eutric Glossoboralf, loamy-skeletal, mixed, thin ash cover phase.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - The above described soil occupies most of this unit, but is highly variable in terms of volcanic ash thickness, rock fragment content and soil mantle depth to bedrock. In some units, up to 30% of the soils may be shallow (less than 20" deep). Rock outcrop comprises approximately 2% of this unit. Up to 20% of the soil profiles do not have horizons of clay accumulation as the result of more active colluviation.

VEGETATIVE CHARACTERISTICS - The dominant vegetation is western red cedar/pachistima (THPL/PAMY) on the dry end of the range. South to west facing microsites support grand fir/pachistima (ABGR/PAMY).

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a very high sediment delivery efficiency and a high mass wasting potential.

ENGINEERING - Potential road construction problems include a very high sediment delivery efficiency with moderate sources of sediment being mass wasting, debris avalanche, and surface erosion. Cutbank sloughing is a maintenance problem.

SILVICULTURE - This landtype has a silvicultural limitation caused by high insolation rates.

POTENTIAL WILDLIFE HABITAT - This landtype is rated low for potential summer habitat due to high insolation rates and lack of diversity. Where elevations are low enough to be accessible during periods of snow accumulations, winter habitat is rated moderate.



LANDTYPE 61-U26



SUMMARY

Number of map delineations - 359
Total acreage - 37,000
Average map unit acreage - 103

These units are located on low elevation, warm aspect, dissected stream breaklands. Soils are moderately deep, somewhat excessively drained, and are developed in undifferentiated parent material. The habitat type is grand fir/pachistima or Douglas-fir/ninebark. Rock outcrop comprises up to 25% of this unit.

LANDFORM 61-DISSECTED STREAM BREAKLANDS

Overall relief consists of very steep dissected stream breaklands which occur adjacent to actively downcutting streams. Dissections occupy at least 25% of the landform.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 1,600 to 5,200 feet
- B. Slope Gradient - Predominately 60+%
- C. Slope Shape - Straight to concave both vertically and horizontally
- D. Overall Relief - Variable up to 3,000 feet
- E. Dissection Spacing - 300 to 1,200 feet averaging 600 feet
- F. Dissection Relief - 50 to 250 feet
- G. Dissection Density - About 10 to 20 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Medium texture parallel

STREAM DENSITY: 2-7 miles/mile²
MEAN: 4 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (80%)

CHANNEL TYPE: Well entrenched over hard bedrock with nick points, low width/depth, high energy, ungraded, stable.

SLOPE WATER MOVEMENT: Overland flow is common on those portions of the unit with thin soils. Runoff is rapid, flashy, and not well regulated.

SEDIMENT DELIVERY: Very efficient with low storage capacity.

PARENT MATERIAL GROUP

This group consists of undifferentiated weakly weathered bedrock. Lithology does not affect basic interpretive criteria. Rock outcrop comprises up to 25% of this unit.



SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 5,200 feet on high energy slopes. Soil profiles are generally less than 48 inches deep and tend to be somewhat droughty. Surface soil is mixed volcanic ash 5 to 11 inches thick. Subsurface soil is coarse textured with 20 to 60% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 8" dark brown silt loam to sandy loam with weak granular structure, nonsticky, nonplastic, 10 to 20% rock fragments, (range 5 to 11" thick).

Subsoil - 8 to 36" brown gravelly sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 30 to 50% rock fragments, (range 20 to 35" thick).

Substratum - 36 to 48" pale brown gravelly sandy loam, loamy sand with 30 to 60% rock fragments.

SOIL CLASSIFICATION - Dystric Xerochrepts, loamy-skeletal, mixed, frigid; Typic Dystrichrepts, loamy-skeletal, mixed, frigid; and rock outcrops.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Shallow, excessively drained soils occur on ridges with deep, well drained profiles in draws and depressions. Shallow soils (lithic - 20") occur on sharp finger ridge points and in the vicinity of rock outcrops.

VEGETATIVE CHARACTERISTICS - The dominant habitat types are grand fir/pachistima (ABGR/PAMY) on well drained sites with grand fir/beargrass (ABGR/XETE) and Douglas-fir/ninebark (PSME/PHMA) on thin or droughty sites. Moist draws may have western red cedar/pachistima (THPL/PAMY).

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect high debris avalanche potential. Sediment delivery efficiency is rated very high. Vegetative cover should be maintained on this unit to prevent surface erosion and dry creep.

ENGINEERING - Potential road construction problems include high debris avalanche, surface and subsol erosion, with a very high risk of this sediment being delivered to streams. Dry cutbank raveling requires maintenance. The revegetation of cut and fill slopes is often difficult due to droughty, shallow soils. Large amounts of nonrippable bedrock are commonly present in this unit.

SILVICULTURE - Shallow, rocky, droughty soils with high insolation rates are major silvicultural considerations. Prescribed fires should be light and cool to maintain soil organic matter and avoid severe surface erosion.

POTENTIAL WILDLIFE HABITAT - This landtype is rated low for summer range due to high insolation rates and lack of water. Winter habitat potential is rated moderate at low elevations where snow depth do not prevent access.



LANDTYPE 61-U30



SUMMARY

Number of map delineations - 354
Total acreage - 21,300
Average map unit acreage - 60

These units are located on rocky, low elevation, warm aspect, dissected stream breaklands. Soils are shallow to moderately deep, excessively drained and are developed in undifferentiated parent material. The habitat type is grand fir/pachistima. Rock outcrop comprises 25 to 60% of this unit.

LANDFORM 61-DISSECTED STREAM BREAKLANDS

Overall relief consists of very steep dissected stream breaklands which occur adjacent to actively downcutting streams. Dissections occupy at least 25% of the landform.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 1,600 to 5,200 feet
- B. Slope Gradient - Predominately 60+%
- C. Slope Shape - Straight to concave both vertically and horizontally
- D. Overall Relief - Variable up to 3,000 feet
- E. Dissection Spacing - 300 to 1,200 feet averaging 600 feet
- F. Dissection Relief - 50 to 250 feet
- G. Dissection Density - About 10 to 20 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Medium texture parallel

STREAM DENSITY: 3-7 miles/mile²
MEAN: 5 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (80%)

CHANNEL TYPE: Weakly entrenched in bedrock with nick points, low width/depth ratio.

SLOPE WATER MOVEMENT: Almost all overland flow, runoff is very rapid, flashy, and not well regulated.

SEDIMENT DELIVERY:

PARENT MATERIAL GROUP

This group consists of undifferentiated weakly weathered bedrock. Lithologic type does not influence major interpretive criteria. Rock outcrop comprises 25 to 60% of this unit.



SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 5,200 feet on high energy slopes. Soil profiles are 16 to 48 inches deep and are droughty. Surface soil is mixed, modified volcanic ash 3 to 9 inches thick on thicker soils. Volcanic ash is missing from the surface of thinner soils. Subsoils are coarse textured and contain 35 to 60% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 7" brown gravelly sandy loam with weak granular structure, nonsticky, nonplastic, 15 to 25% rock fragments, (range 3 to 9" thick).

Subsoil - 7 to 20" brown gravelly sandy loam with loose to very weak subangular blocky structure, nonsticky, nonplastic, 35 to 60% rock fragments, (range 10 to 20" thick).

Substratum - 20 to 36" pale brown gravelly loamy sand, structureless, 40 to 60% rock fragments.

SOIL CLASSIFICATION - Dystric Xerochrepts, loamy-skeletal, mixed, frigid, and rock outcrops.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Deeper soils occur in draws and depressions. Shallow soils occur on interfluvies and adjacent to rock outcrops. Deep soils with ash caps occur as inclusions.

VEGETATIVE CHARACTERISTICS - The dominant habitat types are grand fir/pachistima (ABGR/PAMY) on deeper soils with Douglas-fir/ninebark (PSME/PHMA) on shallow, droughty sites.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect high debris avalanche and surface soil erosion potential as well as very high sediment delivery efficiencies. This landtype produces high sediment levels in the natural state. Vegetative cover is usually sparse because of shallow, droughty soils with rock outcrops, and should be maintained to limit dry creep and surface erosion.

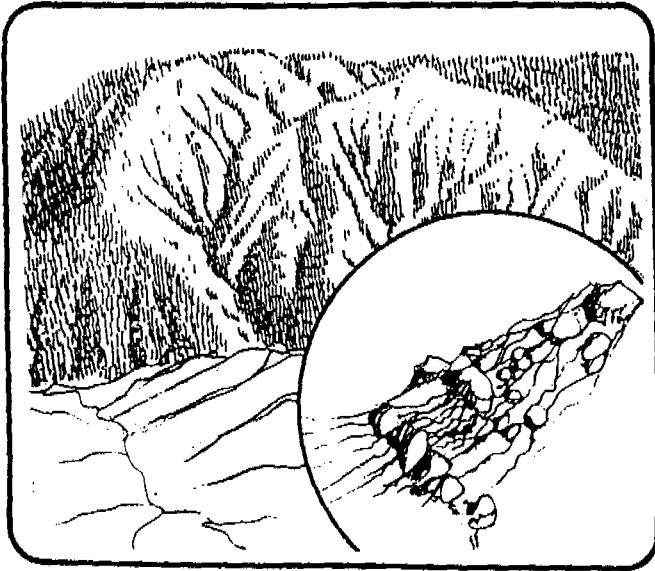
ENGINEERING - Potential road construction problems include high debris avalanche, surface and subsoil erosion with a very high risk of this sediment being delivered to streams. Dry cutbank raveling requires maintenance. The revegetation of cut and fill slopes is often difficult due to droughty, shallow soils. Large amounts of nonrippable bedrock are commonly present in this unit.

SILVICULTURE - This landtype is classed as noncommercial Forest land.

POTENTIAL WILDLIFE HABITAT - This landtype is rated as low for potential summer habitat due to high insolation rates and lack of water. Winter potential is rated moderate at low elevations where snow depths do not limit access.



LANDTYPE 61-U31



SUMMARY

Number of map delineations - 155
Total acreage - 11,400
Average map unit acreage - 74

These units are located on rocky, low elevation, warm aspect, dissected stream breaklands. Soils are shallow to moderately deep, excessively drained, and are developed in undifferentiated parent material. The habitat type is Douglas-fir/ninebark. Rock outcrop comprises over 60% of this unit.

LANDFORM 61-DISSECTED STREAM BREAKLANDS

Overall relief consists of very steep dissected stream breaklands which occur adjacent to actively downcutting streams. Dissections occupy at least 25% of the landform.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 1,600 to 5,000 feet
- B. Slope Gradient - Predominately 60+%
- C. Slope Shape - Straight to concave both vertically and horizontally
- D. Overall Relief - Variable up to 3,000 feet
- E. Dissection Spacing - 300 to 1,200 feet averaging 600 feet
- F. Dissection Relief - 50 to 250 feet
- G. Dissection Density - About 10 to 20 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Medium texture parallel

STREAM DENSITY: 3-7 miles/mile²
MEAN: 5 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (80%)

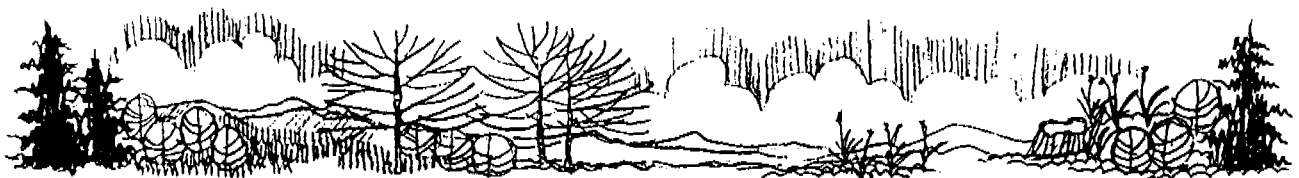
CHANNEL TYPE: Weakly entrenched in bedrock with nick points, low width/depth ratio.

SLOPE WATER MOVEMENT: Almost all overland flow, runoff is very rapid, flashy, and not well regulated.

SEDIMENT DELIVERY:

PARENT MATERIAL GROUP

This group consists of weakly weathered material from the Belt quartzites, the Idaho Batholith granites, and mixed glacial rills. In this undifferentiated group, lithology does not affect basic interpretive criteria. Rock outcrop comprises more than 60% of this unit.



SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 5,000 feet on high energy slopes. Soil profiles are 10 to 36 inches deep and are droughty. Surface soil is highly mixed volcanic ash 3 to 10 inches thick. Subsurface soil is coarse textured with 40 to 70% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 5" yellowish brown gravelly sandy loam, weak granular structure, nonsticky, nonplastic, 15 to 25% rock fragments, (range 3 to 10" thick).

Subsoil/Substratum - 5 to 18" pale brown very gravelly sandy loam, weak subangular blocky structure-structureless, nonsticky, nonplastic, 40 to 70% rock fragments, (range 5 to 14" thick).

SOIL CLASSIFICATION - Rockland - Dystric Xerorthents, loamy-skeletal, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Deeper soils (20 to 48") are scattered throughout the unit as inclusions.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is Douglas-fir/ninebark (PSME/PHMA). Deeper soils may have grand fir/beargrass (ABGR/XETE).

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect high debris avalanche and surface soil erosion potentials. Also rated very high is the sediment delivery efficiency. Major activities such as road construction on this landtype have the potential for severe watershed drainage.

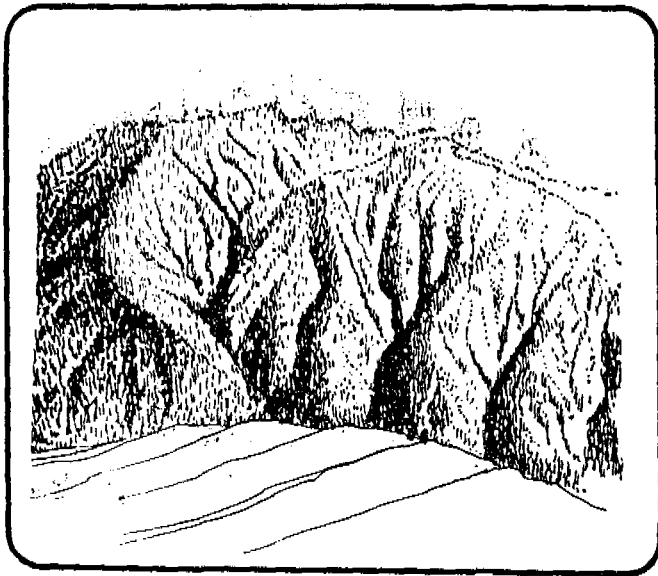
ENGINEERING - Potential road construction problems include high debris avalanche, surface and subsoil erosion with a very high risk of this sediment being delivered to streams. Dry cutbank raveling requires maintenance. The revegetation of cut and fill slopes is often difficult due to droughty, shallow soils.

SILVICULTURE - This landtype is classified as noncommercial forest land.

POTENTIAL WILDLIFE HABITAT - This landtype is rated low for both summer and winter habitat because of lack of food, water, cover, and diversity.



LANDTYPE 61-U60



SUMMARY

Number of map delineations - 47
Total acreage - 3,700
Average map unit acreage - 85

These units are located on high elevation, cool aspect, dissected stream breaklands. Soils are deep, well drained, and are developed in undifferentiated parent material. The habitat type is subalpine fir/pachistima.

LANDFORM 61-DISSECTED STREAM BREAKLANDS

Overall relief consists of very steep dissected stream breaklands which occur adjacent to actively downcutting streams. Dissections occupy at least 25% of the landform.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 4,800 to 5,600 feet
- B. Slope Gradient - Predominately 60+%
- C. Slope Shape - Straight to concave both vertically and horizontally
- D. Overall Relief - Variable up to 3,000 feet
- E. Dissection Spacing - 300 to 1,200 feet averaging 600 feet
- F. Dissection Relief - 50 to 250 feet
- G. Dissection Density - About 10 to 20 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Medium texture parallel

STREAM DENSITY: 3-7 miles/mile²
MEAN: 5 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (80%)

CHANNEL TYPE: Well entrenched with bedrock control, low width/depth ratio, steep high energy with nick points.

SLOPE WATER MOVEMENT: Subsurface with rapid movement along bedrock, soil mantle interface. Subsurface concentrations in draw heads and lower slope margins.

SEDIMENT DELIVERY: Slopes and channels are highly efficient with low sediment storage capacity.

PARENT MATERIAL GROUP

This group consists of moderate to weakly weathered bedrock. Lithologic type does not influence major interpretative criteria.



SOIL-VEGETATIVE UNIT

This unit occurs at elevations above 4,800 feet on low energy slopes. Soil profiles are 60+ inches deep. Surface soil is volcanic ash 9 to 22 inches thick. Subsurface soil is coarse textured with 30 to 60% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 15" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 9 to 22" thick).

Subsoil - 15 to 30 " brown gravelly sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 30 to 60% rock fragments, (range 10 to 30" thick).

Substratum - 30 to 60"+ pale brown gravelly sandy loam, structureless, nonsticky, nonplastic, 30 to 60% rock fragments.

SOIL CLASSIFICATION - Entic Cryandepts, medial/loamy-skeletal, mixed, and Andic Cryochrepts, Toamy-skeletal, mixed.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Thin (1 to 3" thick) surface horizons are common to the unit. Mixed ash caps with sandy loam textures occur on slopes with active colluvial mixing.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is subalpine fir/pachistima (ABLA/PAMY). Subalpine fir/menziesia occurs along the upper margins of the unit.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a very high sediment delivery efficiency. Other ratings are low to moderate. This is a relatively stable breakland unit.

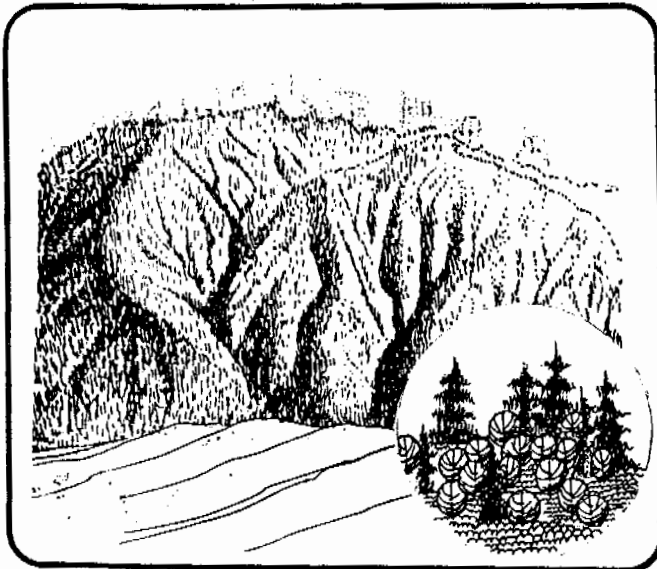
ENGINEERING - Potential road construction problems include a high mass wasting hazard with a very high risk of sediment being delivered to streams. Fill sloughing is a maintenance problem.

SILVICULTURE - There are no major silvicultural limitations for this landtype.

POTENTIAL WILDLIFE HABITAT - This landtype is rated as moderate for potential summer habitat and low for winter habitat. The low winter rating is due to snow depths and inaccessibility.



LANDTYPE 61-U61



SUMMARY

Number of map delineations - 29
Total acreage - 2,700
Average map unit acreage - 92

These units are located on high elevation, cool aspect, dissected stream breaklands. Soils are deep, well drained and developed in undifferentiated parent material. Vegetation is brush and shrubs with scattered timber.

LANDFORM 61-DISSECTED STREAM BREAKLANDS

Overall relief consists of very steep dissected stream breaklands which occur adjacent to actively downcutting streams. Dissections occupy at least 25% of the landform.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 4,800 to 6,000 feet
- B. Slope Gradient - Predominately 60+%
- C. Slope Shape - Straight to concave both vertically and horizontally
- D. Overall Relief - Variable up to 3,000 feet
- E. Dissection Spacing - 300 to 1,200 feet averaging 600 feet
- F. Dissection Relief - 50 to 250 feet
- G. Dissection Density - About 10 to 20 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Medium texture parallel

STREAM DENSITY: 3-7 miles/mile²
MEAN: 5 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (60%)

CHANNEL TYPE: Well entrenched with bedrock control, low width/depth ratio, steep high energy with nick points.

SLOPE WATER MOVEMENT: Subsurface with rapid movement along bedrock, soil mantle interface. Subsurface concentrations in draw heads and lower slope margins.

SEDIMENT DELIVERY: Slopes and channels are highly efficient with low sediment storage capacity.

PARENT MATERIAL GROUP

This group consists of undifferentiated bedrock. The lithologic type does not influence basic interpretive criteria.



SOIL-VEGETATIVE UNIT

This unit occurs at elevations above 4,800 feet on low energy slopes. Soils are 60+ inches deep. Surface soil is darkened, modified volcanic ash 6 to 16 inches thick. Subsurface soil is coarse textured with 20 to 60% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 12" very dark brown and dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 6 to 16" thick).

Subsoil - 12 to 38" brown gravelly sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 20 to 40% rock fragments, (range 10 to 30" thick).

Substratum - 38 to 60"+ pale brown gravelly sandy loam, structureless, nonsticky, nonplastic, 30 to 60% rock fragments.

SOIL CLASSIFICATION - Andic Cryumbrepts, loamy-skeletal, mixed, and Andic Cryochrepts, loamy-skeletal, mixed.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - This unit may have high water tables in early spring during snowmelt, but these are not year round.

VEGETATIVE CHARACTERISTICS - Brush and shrub vegetation is uniform and dense over the unit. Timber is scattered with low basal area and does not occur in clumps.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a high mass wasting potential and a very high sediment delivery efficiency. Other ratings are low to moderate.

ENGINEERING - Potential road construction problems include a high mass wasting hazard with a very high risk of sediment being delivered to streams. Brush encroachment is a maintenance problem.

SILVICULTURE - Major silvicultural limitations are severe brush competition and dark colored umbric soils.

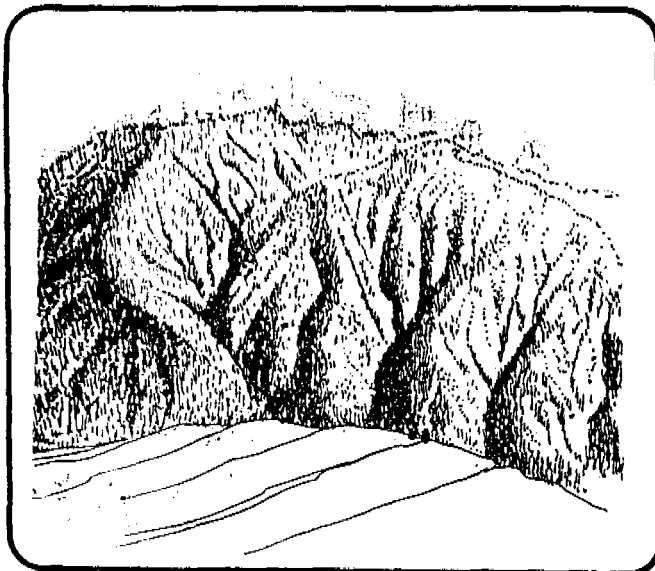
POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate in potential for summer habitat and low for winter habitat due to inaccessibility.



II-307

183

LANDTYPE 61-U66



SUMMARY

Number of map delineations - 28
Total acreage 3,600
Average map unit acreage - 129

These units are located on high elevation, cool aspect, dissected stream breaklands. Soils are deep, well drained, and are developed in undifferentiated parent material. The habitat type is subalpine fir/menziesia.

LANDFORM 61-DISSECTED STREAM BREAKLANDS

Overall relief consists of very steep dissected stream breaklands which occur adjacent to actively downcutting streams. Dissections occupy at least 25% of the landform.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 5,000 to 6,000 feet
- B. Slope Gradient - Predominately 60+%
- C. Slope Shape - Straight to concave both vertically and horizontally
- D. Overall Relief - Variable up to 3,000 feet
- E. Dissection Spacing - 300 to 1,200 feet averaging 600 feet
- F. Dissection Relief - 50 to 250 feet
- G. Dissection Density - About 10 to 20 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Medium texture parallel

STREAM DENSITY: 3-7 miles/mile²
MEAN: 5 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (80%)

CHANNEL TYPE: Well entrenched with bedrock control, low width/depth ratio, steep high energy with nick points.

SLOPE WATER MOVEMENT: Subsurface with rapid movement along bedrock, soil mantle interface. Subsurface concentrations in draw heads and lower slope margins.

SEDIMENT DELIVERY: Slopes and channels are highly efficient with low sediment storage capacity.

PARENT MATERIAL GROUP

This group consists of weakly weathered, undifferentiated colluvial material and glacial tills. Lithology does not influence major interpretive criteria.



SOIL-VEGETATIVE UNIT

This unit occurs at elevations above 5,000 feet on low energy slopes. Soil profiles are 60+ inches deep. Surface soil is volcanic ash 9 to 20 inches thick. Subsurface soil is coarse textured with 20 to 60% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 14" very dark brown and dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 9 to 20" thick).

Subsoil - 14 to 32" brown gravelly sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 20 to 60% rock fragments, (range 7 to 28" thick).

Substratum - 32 to 60"+ pale brown gravelly sandy loam, structureless, nonsticky, nonplastic, 30 to 60% rock fragments.

SOIL CLASSIFICATION - Entic Cryandepts, medial/loamy-skeletal, mixed, and Andic Cryochrepts, loamy-skeletal, mixed.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Umbric soils with dark colored surface horizons are common inclusions.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is subalpine fir/menziesia (ABLA/MEFE).

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a very high sediment delivery efficiency. Other ratings are low to moderate. This is a relatively stable breakland unit.

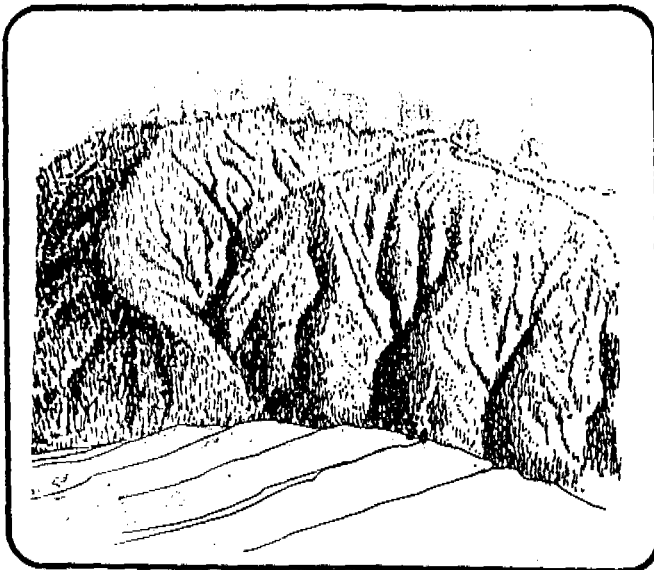
ENGINEERING - Potential road construction problems include a very high sediment delivery efficiency into streams. Moderate sediment sources are mass wasting, debris avalanche, and subsoil erosion. Brush encroachment is a maintenance problem.

SILVICULTURE - The main silvicultural limitation is severe brush competition.

POTENTIAL WILDLIFE HABITAT - This landtype is rated at moderate for potential summer range and low for winter habitat. Snow depths, which limit access, are reasons for the low winter rating.



LANDTYPE 61-U70



SUMMARY

Number of map delineations - 36
Total acreage - 3,100
Average map unit acreage - 85

These units are located on high elevation, warm aspect, dissected stream breaklands. Soils are deep, well drained, and are developed in undifferentiated parent material. The habitat type is subalpine fir/pachistima.

LANDFORM 61-DISSECTED STREAM BREAKLANDS

Overall relief consists of very steep dissected stream breaklands which occur adjacent to actively downcutting streams. Dissections occupy at least 25% of the landform.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 4,800 to 6,000 feet
- B. Slope Gradient - Predominately 60+%
- C. Slope Shape - Straight to concave both vertically and horizontally
- D. Overall Relief - Variable up to 3,000 feet
- E. Dissection Spacing - 300 to 1,200 feet averaging 600 feet
- F. Dissection Relief - 50 to 250 feet
- G. Dissection Density - About 10 to 20 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Medium texture parallel

STREAM DENSITY: 3-7 miles/mile²
MEAN: 5 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (90%)

CHANNEL TYPE: Well entrenched with bedrock control, low width/depth ratio, steep high energy with nick points.

SLOPE WATER MOVEMENT: Subsurface with rapid movement along bedrock, soil mantle interface. Subsurface concentrations in draw heads and lower slope margins.

SEDIMENT DELIVERY: Slopes and channels are highly efficient with low sediment storage capacity.

PARENT MATERIAL GROUP

This group consists of weakly weathered material from the Belt quartzites, the Idaho Batholith granites, and mixed glacial tills. In this undifferentiated group, lithology does not affect major interpretive criteria.



SOIL-VEGETATIVE UNIT

This unit occurs at elevations above 4,800 feet on high energy slopes. Soil profiles are 60+ inches deep. Surface soil is mixed volcanic ash 9 to 19 inches thick. Subsurface soil is coarse textured with 20 to 60% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 10" dark brown sandy loam with weak granular structure, nonsticky, nonplastic, 10 to 20% rock fragments, (range 9 to 19" thick).

Subsoil - 10 to 38" brown gravelly sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 20 to 55% rock fragments, (range 10 to 30" thick).

Substratum - 38 to 60"+ pale brown gravelly sandy loam, structureless, nonsticky, nonplastic, 25 to 60% rock fragments.

SOIL CLASSIFICATION - Andic Cryochrepts, loamy-skeletal, mixed.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS -

VEGETATIVE CHARACTERISTICS - The dominant habitat type is subalpine fir/pachistima (ABLA/PAMY).

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a very high sediment delivery efficiency. Other ratings are low to moderate. This is a relatively stable breakland unit.

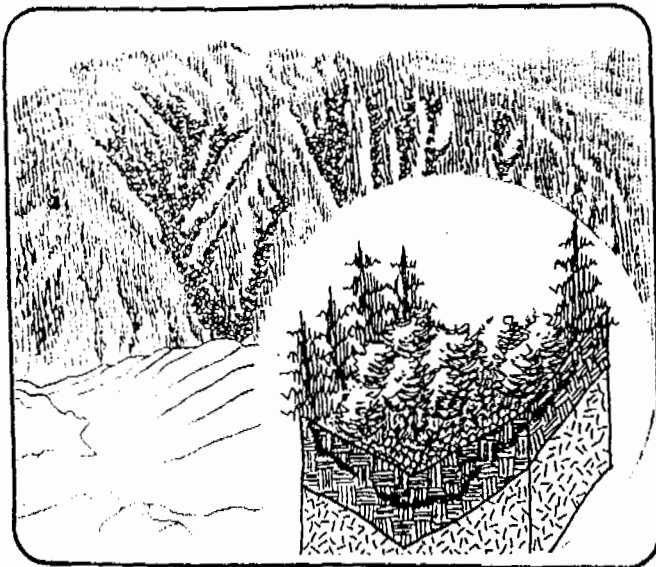
ENGINEERING - Potential road construction problems include a very high sediment delivery efficiency into streams. Moderate sediment sources are mass wasting debris avalanche, surface erosion, and subsoil erosion.

SILVICULTURE - The main silvicultural limitations are mixed ash surfaces, high surface rock content and high insolation rates.

POTENTIAL WILDLIFE HABITAT - This landtype is rated low for both summer and winter potential habitat. Lack of diversity and high insolation rate are reasons for the low summer rating, while snow depths which limit access result in a low winter rating.



LANDTYPE 61-U92



SUMMARY

Number of map delineations - 89
Total acreage - 7,900
Average map unit acreage - 89

These units are located on high elevation, dissected stream breaklands. Soils are well drained on ridges, poorly drained in concave areas, and have deep profiles developed in undifferentiated parent material. The habitat type is subalpine fir/pachistima with riparian vegetation in wet concave areas.

LANDFORM 61-DISSECTED STREAM BREAKLANDS

Overall relief consists of very steep dissected stream breaklands which occur adjacent to actively downcutting streams. Dissections occupy at least 25% of the landform.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 4,800 to 6,000 feet
- B. Slope Gradient - Predominately 60+%
- C. Slope Shape - Straight to concave both vertically and horizontally
- D. Overall Relief - Variable up to 3,000 feet
- E. Dissection Spacing - 300 to 1,200 feet averaging 600 feet
- F. Dissection Relief - 50 to 250 feet
- G. Dissection Density - About 10 to 20 miles/mile²

SOPE HYDROLOGY

DRAINAGE PATTERN: Medium texture parallel

STREAM DENSITY: 3-7 miles/mile²
MEAN: 5 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (80%)

CHANNEL TYPE: Well entrenched, low width/depth ratio, high energy, running through colluvial material, but bedrock controlled with nick points.

SLOPE WATER MOVEMENT: Mostly subsurface with seeps and springs and perched water tables occurring between dissections with live streams in dissections.

SEDIMENT DELIVERY: Slopes are highly efficient, low storage capacity.

PARENT MATERIAL GROUP

This group consists of weakly weathered material from the Belt quartzites, the Idaho Batholith granites, and mixed glacial tills. In this undifferentiated group, lithology does not affect major interpretive criteria.



SOIL-VEGETATIVE UNIT

This unit occurs at elevations above 4,800 feet on all aspect slopes. Soil profiles are 60+ inches deep. Well drained ridge soils have a volcanic ash surface 8 to 16 inches thick. Poorly drained concave depression soils have a modified volcanic ash surface 7 to 20 inches thick. Subsurface soil is coarse textured with 20 to 60% rock fragments. Naturally dense fragipan layers may occur in concave areas resulting in perched water.

TYPICAL SOIL PROFILES

(Well drained soil)

Surface Soil - 0 to 14" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 8 to 16" thick).

Subsoil - 14 to 36" brown gravelly sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 20 to 40% rock fragments, (range 20 to 30" thick).

Substratum - 36 to 60"+ light brown gravelly sandy loam, structureless, nonsticky, nonplastic, 20 to 60% rock fragments.

(Poorly drained soil)

Surface Soil - 0 to 14" very dark brown silt loam with weak subangular blocky structure, nonsticky, nonplastic, (range 7 to 20" thick).

Subsoil - 14 to 30" dark greyish brown gravelly sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 20 to 60% rock fragments, (range 15 to 30" thick).*

Substratum - 30 to 36"+ pale brown gravelly sandy loam, structureless, nonsticky, nonplastic, 20 to 60% rock fragments.*

*NOTE: These horizons may have a naturally dense (fragipan) layer which can cause perching of water and poor drainage.

SOIL CLASSIFICATION - Typic Cryumbrepts, loamy-skeletal, mixed, and Andic Cryochrepts, loamy-skeletal, mixed.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Poorly drained soils occur in concave depression areas.

VEGETATIVE CHARACTERISTICS - The dominant habitat type on well drained sites is subalpine fir/pachistima (ABLA/PAMY). Poorly drained depressions have alder, fern, and sedge vegetation. Timber normally occurs as clumps in this unit.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a high mass wasting potential and a very high sediment delivery efficiency.

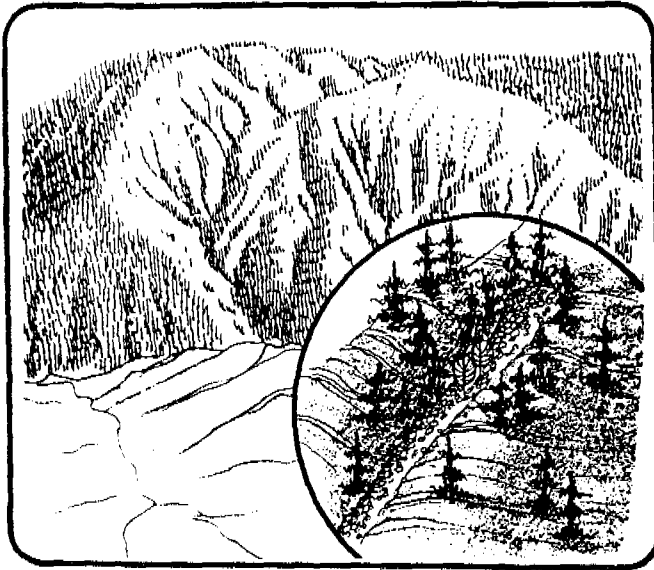
ENGINEERING - Potential road construction problems are associated with wet areas and include a high mass wasting potential with a very high risk of sediment being delivered to streams. Cutbank and fill sloughing as well as rapid brush encroachment are maintenance problems.

SILVICULTURE - Silvicultural limitations for this unit are related to high seasonal water tables, severe brush competition and dark colored umbric soils, all of which occur in wet concave areas.

POTENTIAL WILDLIFE HABITAT - This landtype has properties such as food, water, cover, and vegetative diversity which are important components of wildlife habitat and is rated as having high potential as summer habitat. Because of inaccessibility during periods of snow accumulation, the rating for winter potential is low.



LANDTYPE 61-U96



SUMMARY

Number of map delineations - 90
Total acreage - 22,700
Average map unit acreage - 252

These units are located on high elevation, dissected stream breaklands. Soils are both well and poorly drained with variable depths. Parent material is undifferentiated. The vegetation is dominated by shrubs and forbs. These are avalanche debris deposits.

LANDFORM 61-DISSECTED STREAM BREAKLANDS

Overall relief consists of very steep dissected stream breaklands which occur adjacent to actively downcutting streams. Dissections occupy at least 25% of the landform.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 4,000 to 6,000 feet
- B. Slope Gradient - Predominately 60+%
- C. Slope Shape - Straight to concave both vertically and horizontally
- D. Overall Relief - Variable up to 3,000 feet
- E. Dissection Spacing - 300 to 1,200 feet averaging 600 feet
- F. Dissection Relief - 50 to 250 feet
- G. Dissection Density - About 10 to 20 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Medium texture parallel

STREAM DENSITY: 3-7 miles/mile²
MEAN: 5 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (30%)

CHANNEL TYPE: Well entrenched with bedrock control, low width/depth ratio, steep high energy with nick points.

SLOPE WATER MOVEMENT: Subsurface with rapid movement along bedrock, soil mantle interface. Subsurface concentrations in draw heads and lower slope margins.

SEDIMENT DELIVERY: Slopes and channels are highly efficient with low sediment storage capacity.

PARENT MATERIAL GROUP

This group consists of undifferentiated bedrock which has undergone scouring and spalling, and includes deep colluvial avalanche debris. Rock outcrop comprises 20 to 50% of the unit. Scree is common.



SOIL-VEGETATIVE UNIT

This unit occurs at elevations above 4,000 feet on variable aspect slopes. Soil profiles are highly variable but tend to be 60+ inches deep. Soils are both well and poorly drained with high rock fragment content.

SOIL CLASSIFICATION - Cryochrepts and Cryumbrepts avalanche phase.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS -

VEGETATIVE CHARACTERISTICS - Vegetation is variable due to the range in elevation. Much of the unit consists of avalanche material interspersed with shrubs and forbs. Wet areas have alder and sedge vegetation.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect high surface erosion and debris avalanche potentials with a very high sediment delivery efficiency. Other ratings are low and moderate.

ENGINEERING - Potential road construction problems are associated with wet debris deposits and include high mass wasting as well as avalanche hazards. There is a very high risk of sediment from these sources being delivered to streams. Road maintenance includes snow avalanche removal and associated damages.

SILVICULTURE - This landtype is classed as noncommercial forest land.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate for summer habitat and low for winter habitat due to snow depths and inaccessibility.



LANDTYPE 63-610



SUMMARY

Number of map delineations - 27
Total acreage - 1,600
Average map unit acreage - 59

These units are located on low elevation, stream headlands. Soils are deep, well drained, and are developed in granite and gneiss parent material. The habitat type is western red cedar/pachistima.

LANDFORM 63 STREAM HEADLANDS

Overall relief is typified by very steep stream headlands which occur in the upper parts of drainages. This landform generally has several first order drainages converging together.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 4,000 to 4,800 feet
- B. Slope Gradient - Predominantly 60+% with steepest gradients near the upper margin and lowest gradients in the lower margins
- C. Slope Shape - Concave both vertically and horizontally, inverted disc shape
- D. Overall Relief - 250 to 1,000 feet
- E. Dissection Spacing - Merging
- F. Dissection Relief - 10 to 100 feet
- G. Dissection Density - 4 to 6 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Pinate

STREAM DENSITY: 3-7 miles/mile²
MEAN: 4.25 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (100%)

CHANNEL TYPE: Steep with little grading, runs through colluvial material but with bedrock control, high energy, weak development except low in the unit.

SLOPE WATER MOVEMENT: Concentrated subsurface flows with streams forming in lower portion of unit. Seeps and springs are common.

SEDIMENT DELIVERY: Very high on slope and in channel, little storage capacity.

OTHER IMPORTANT CHARACTERISTICS: Concentrates both water and sediment to one common point low in the unit.

PARENT MATERIAL GROUP

This group consists of moderate to weakly weathered granites and associated gneisses of the Idaho Batholith.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,800 feet on low energy slopes. Soil profiles are 60+ inches deep. Surface soil is volcanic ash 12 to 24 inches thick. Subsurface soil is coarse textured with 20 to 60% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 16" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 12 to 24" thick).

Subsoil - 16 to 36" brown gravelly sandy loam with granular structure, nonsticky, nonplastic, 20 to 45% rock fragments, (range 8 to 40" thick).

Substratum - 36 to 60"+ pale brown gravelly sandy loam, structureless, nonsticky, nonplastic, 20 to 60% rock fragments.

SOIL CLASSIFICATION - Typic Vitrandepts, medial/loamy-skeletal, mixed, frigid, and Andic Dystrachrepts, coarse-loamy, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Soils are uniform over the unit and variations are limited to ash surface mixing in areas of active colluvial movement and subsoil rock content. The soils on these units are approximately 60% skeletal and 40% nonskeletal.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is western red cedar/pachistima (THPL/PAMY).

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a very high sediment delivery efficiency and a high mass wasting potential. Other ratings are low to moderate.

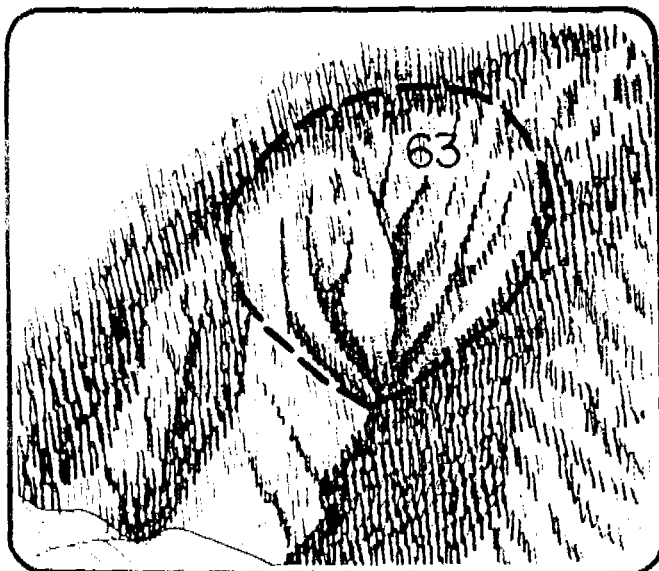
ENGINEERING - Potential road construction includes a high mass wasting hazard and high erosion from the excavated road prism. There is a very high risk of sediment from these sources being delivered to streams.

SILVICULTURE - This landtype has no major silvicultural limitations.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate for potential summer and winter habitat. The winter rating applies only to low elevations which are accessible during periods of snow accumulation.



LANDTYPE 63-620



SUMMARY

Number of map delineations - 20
Total acreage - 1,300
Average map unit acreage - 65

These units are located on low elevation, warm aspect, stream headlands. Soils are deep, well drained, and are developed in granite and gneiss parent material. The habitat type is western red cedar/pachistima.

LANDFORM 63 STREAM HEADLANDS

Overall relief is typified by very steep stream headlands which occur in the upper parts of drainages. This landform generally has several first order drainages converging together.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 4,000 to 4,800 feet
- B. Slope Gradient - Predominantly 60+% with steepest gradients near the upper margin and lowest gradients in the lower margins
- C. Slope Shape - Concave both vertically and horizontally, inverted disc shape
- D. Overall Relief - 250 to 1,000 feet
- E. Dissection Spacing - Merging
- F. Dissection Relief - 10 to 100 feet
- G. Dissection Density - 4 to 6 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Pinate

STREAM DENSITY: 3-7 miles/mile²
MEAN: 4.25 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (100%)

CHANNEL TYPE: Steep with little grading, runs through colluvial material but with bedrock control, high energy, weak development except low in the unit.

SLOPE WATER MOVEMENT: Concentrated subsurface flows with streams forming in lower portion of unit. Seeps and springs are common.

SEDIMENT DELIVERY: Very high on slope and in channel, little storage capacity.

OTHER IMPORTANT CHARACTERISTICS: Concentrates both water and sediment to one common point low in the unit.

PARENT MATERIAL GROUP

This group consists of moderate to weakly weathered granites and associated gneisses from the Idaho batholith.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,800 feet on high energy slopes. Soil profiles are 60+ inches deep. Surface soil is volcanic ash 8 to 20 inches thick. Subsurface soil is coarse textured with 10 to 50% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 12" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 8 to 20" thick).

Subsoil - 12 to 36" brown gravelly sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 10 to 40% rock fragments, (range 10 to 40" thick).

Substratum - 36 to 60"+ pale brown gravelly sandy loam, structureless, nonsticky, nonplastic, 20 to 50% rock fragments.

SOIL CLASSIFICATION - Andic Dystrachrepts, loamy-skeletal, mixed, frigid, and Typic Vitrandepts, medial/loamy, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Soil variations include ash cap mixing in areas of colluvial movement and the amount of rock content. Shallow (lithic) soils may occur in association with rock outcrops. The soils of this unit are approximately 60% skeletal and 40% nonskeletal.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is western red cedar/pachistima (THPL/PAMY) with grand fir/pachistima occurring on ridge points with droughty soils.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a very high slope delivery efficiency. Mass wasting potential is rated high.

ENGINEERING - Potential road construction includes a high mass wasting hazard, and high erosion from the excavated road prism. There is a very high risk of sediment from these sources being delivered to streams. Cutbank raveling is a maintenance problem.

SILVICULTURE - The high insolation rate is a major silvicultural limitation for this landtype.

POTENTIAL WILDLIFE HABITAT - This landtype is rated low for potential summer habitat because of high insolation rates and lack of diversity. Winter habitat potential is rated moderate at low elevations which are accessible during periods of snow accumulation.



LANDTYPE 63-626



SUMMARY

Number of map delineations - 20
Total acreage - 1,000
Average map unit acreage - 50

These units are located on low elevation, warm aspect, stream headlands. Soils are moderately deep, somewhat excessively drained, and are developed in granite and gneiss parent material. The habitat type is grand fir/pachistima. Rock outcrop comprises up to 25% of this unit.

LANDFORM 63 STREAM HEADLANDS

Overall relief is typified by very steep stream headlands which occur in the upper parts of drainages. This landform generally has several first order drainages converging together.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 4,000 to 4,800 feet
- B. Slope Gradient - Predominantly 60+% with steepest gradients near the upper margin and lowest gradients in the lower margins
- C. Slope Shape - Concave both vertically and horizontally, inverted disc shape
- D. Overall Relief - 250 to 1,000 feet
- E. Dissection Spacing - Merging
- F. Dissection Relief - 10 to 100 feet
- G. Dissection Density - 4 to 6 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Pinate

STREAM DENSITY: 3-7 miles/mile²
MEAN: 4.25 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (100%)

CHANNEL TYPE: Very weakly incised in colluvial debris in lower portion of the unit. High energy.

SLOPE WATER MOVEMENT: Overland flow is common on those portions of the unit with thin soils. Runoff is rapid, glashy, and not well regulated.

SEDIMENT DELIVERY: Very high on slope and in channel with low storage capacity.

OTHER IMPORTANT CHARACTERISTICS. Concentrates both water and sediment through one common point low in unit.

PARENT MATERIAL GROUP

This group consists of moderate to weakly weathered granitics and associated gneisses from the Idaho Batholith. Rock outcrop comprises up to 25% of this unit.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,800 feet on high energy slopes. Soil profiles are generally less than 48 inches deep and tend to be somewhat droughty. Surface soil is mixed volcanic ash 4 to 12 inches thick. Subsurface soil is coarse textured with 30 to 60% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 8" dark brown silt loam to sandy loam with weak granular structure, nonsticky, nonplastic, 10 to 20% rock fragments, (range 4 to 12 inches thick).

Subsoil - 8 to 36" brown gravelly sandy loam with weak subangular blocky structure-massive, nonsticky, nonplastic, 30 to 50% rock fragments, (range 10 to 35" thick).

Substratum - 36 to 48" pale brown gravelly sandy loam to loamy sand, 30 to 60% rock fragments.

SOIL CLASSIFICATION - Andic Dystrichrepts, and Dystric Xerochrepts, loamy-skeletal, mixed, frigid, with rock outcrop.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Moderate depth, excessively drained soils occur on ridges with deep, well drained soils scouring in draws and depressions. Shallow soils (lithic - 20") occur on sharp finger ridge points and in the vicinity of rock outcrops. Ash caps are usually mixed and may have sandy loam textures. The soils of this unit are approximately 65% skeletal and 35% nonskeletal.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is grand fir/pachistima (ABGR/PAMY) with Douglas-fir/ninebark occurring in thin droughty soils. Western red cedar/pachistima will occur as stringers in moist draws and along the lower margins of the unit.

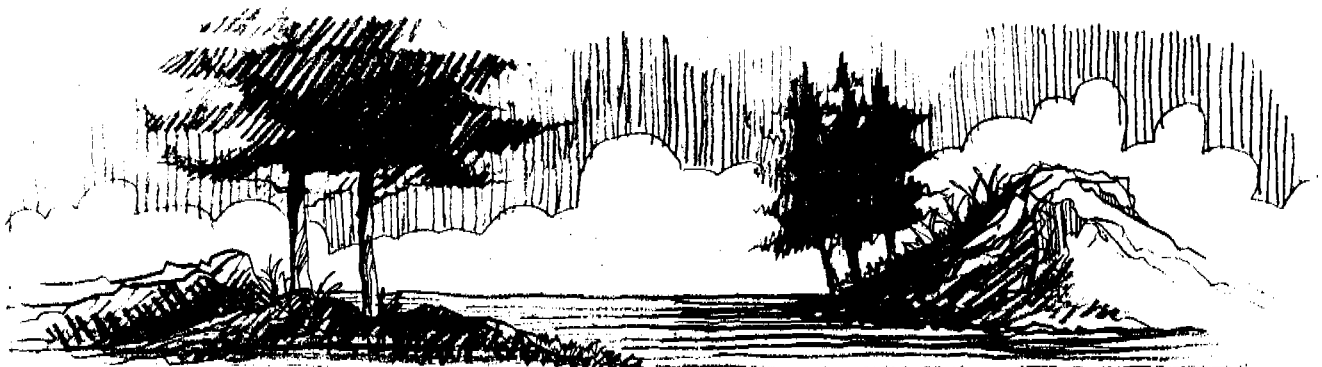
MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a high debris avalanche potential with very high sediment delivery efficiency. Surface erosion potential is rated as high. Vegetative cover should be maintained on this unit to prevent surface erosion and dry creep.

ENGINEERING - Potential road construction problems include a high debris avalanche hazard and high erosion from the excavated road prism. There is a very high risk of sediment from these sources being delivered to streams. Large amounts of nonrippable rock are present. Dry cutbank raveling is a maintenance problem. The revegetation of cut and fill slopes is difficult on this landtype.

SILVICULTURE - Shallow, rocky, droughty soils with high insolation rates are major silvicultural limitations. Prescribed fires should be light and cool to maintain soil organic matter and to avoid severe surface erosion.

POTENTIAL WILDLIFE HABITAT - This landtype is rated low for summer habitat because of high insolation rates and lack of diversity. Winter habitat potential is rated moderate at low elevations which are accessible during periods of snow accumulation.



LANDTYPE 63-644



SUMMARY

Number of map delineations - 17
Total acreage - 900
Average map unit acreage - 54

These units are located on low elevation stream headlands. Soils are well drained on ridges, poorly drained in stringer areas, and have deep profiles developed in granite and gneiss parent material. The habitat type is western red cedar/pachistima with riparian vegetation in wet stringer areas.

LANDFORM 63 STREAM HEADLANDS

Overall relief is typified by very steep stream headlands which occur in the upper parts of drainages. This landform generally has several first order drainages converging together.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 3,500 to 4,800 feet
- B. Slope Gradient - Predominantly 60+% with steepest gradients near the upper margin and lowest gradients in the lower margins
- C. Slope Shape - Concave both vertically and horizontally, inverted disc shape
- D. Overall Relief - 250 to 1,000 feet
- E. Dissection Spacing - Merging
- F. Dissection Relief - 10 to 100 feet
- G. Dissection Density - 4 to 6 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Pinate

STREAM DENSITY: 3-7 miles/mile²
MEAN: 4.25 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (100%)

CHANNEL TYPE: Steep with very little grading, runs through colluvial material, but with bedrock control, high energy, weak development except low in the unit.

SLOPE WATER MOVEMENT: Concentrated subsurface flows with high water tables over much of the lower two-thirds of the unit with common seeps and springs.

SEDIMENT DELIVERY: Very high on slope and in channels, little storage capacity.

OTHER IMPORTANT CHARACTERISTICS: Concentrates both water and sediment through one common point low in the unit.

PARENT MATERIAL GROUP

This group consists of moderately to weakly weathered granites and associated gneisses from the Idaho Batholith.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,800 feet on all aspect slopes. Soil profiles are 60+ inches deep. Well drained ridge soils have a volcanic ash surface 8 to 28 inches thick. Poorly drained stringer soils have a darkened, modified volcanic ash surface 10 to 20 inches thick. Subsurface soil is coarse textured with 10 to 60% rock fragments. Naturally dense fragipan layers may occur in stringers, resulting in perched water.

TYPICAL SOIL PROFILES

(Well drained soil)

Surface Soil - 0 to 18" dark brown silt loam with weak granular structure, nonsticky, nonplastic, less than 10% rock fragments, (range 8 to 28" thick).

Subsoil - 18 to 38" brown sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 10 to 30% rock fragments, (range 12 to 30" thick).

Substratum - 38 to 60"+ pale brown gravelly sandy loam to loamy sand, structureless, nonsticky, nonplastic, 30 to 60% rock fragments.

(Poorly drained soil - draws)

Surface Soil - (modified ash) 0 to 15" very dark brown to black silt loam, weak granular structure, slightly sticky, nonplastic, less than 10% rock fragments, (range 10 to 20" thick).

Subsoil/Substratum - 15"+ usually poorly drained, range from gleyed sandy material to gravelly loam fragipans.

SOIL CLASSIFICATION - Typic Vitrandepts, medial/loamy-skeletal, mixed, frigid; Andic Dystrachrepts, Toamy-skeletal, mixed, frigid; and Typic Haplumbrepts, coarse-loamy, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Soils with gussic (sandy) parent material can occur in this unit. Approximately 60% of the soils in this unit are skeletal and 40% are nonskeletal.

VEGETATIVE CHARACTERISTICS - The dominant habitat type on well drained sites is western red cedar/pachistima (THPL/PAMY), with smaller areas of grand fir/pachistima (ABGR/PAMY) on ridges. Poorly drained sites support alder, fern, and sedge vegetation which occurs as long narrow strips.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect very high mass wasting potential and slope sediment delivery efficiencies. Other ratings are low to moderate.

ENGINEERING - Potential road construction problems are associated with wet areas and include a very high mass wasting hazard and rate of sediment delivery to streams. Erosion from the excavated road prism is rated high. Cutbank and fill sloughing with rapid brush encroachment require maintenance.

SILVICULTURE - Silvicultural limitations for this landtype are related to severe brush competition, high water tables, and dark colored umbric soils, all of which are dominant in wet stringer areas. Soil compaction potential is also rated high in wet parts of this unit. Ridges and other well drained portions of this landtype have few silvicultural limitations.

POTENTIAL WILDLIFE HABITAT - This landtype is rated high for potential summer and winter habitat because of available food, water, cover, and diversity. The winter rating applies only to low elevations where snow accumulations do not limit access.



LANDTYPE 63-S10



SUMMARY

Number of map delineations - 20
Total acreage - 1,600
Average map unit acreage - 80

These units are located on low elevation, cool aspect, stream headlands. Soils are deep, well drained, and are developed in micaceous schist and gneiss parent material. The habitat type is western red cedar/pachistima.

LANDFORM 63 STREAM HEADLANDS

Overall relief is typified by very steep stream headlands which occur in the upper parts of drainages. This landform generally has several first order drainages converging together.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 3,000 to 4,800 feet
- B. Slope Gradient - Predominantly 60+% with steepest gradients near the upper margin and lowest gradients in the lower margins
- C. Slope Shape - Concave both vertically and horizontally, inverted disc shape
- D. Overall Relief - 250 to 1,000 feet
- E. Dissection Spacing - Merging
- F. Dissection Relief - 10 to 100 feet
- G. Dissection Density - 4 to 6 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Pinate

STREAM DENSITY: 3-7 miles/mile²
MEAN: 4.25 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (100%)

CHANNEL TYPE: Steep with little grading, runs through colluvial material but with bedrock control, high energy, weak development except low in the unit.

SLOPE WATER MOVEMENT: Concentrated subsurface flows with streams forming in lower portion of unit. Seeps and springs are common.

SEDIMENT DELIVERY: Very high on slope and in channel, little storage capacity.

OTHER IMPORTANT CHARACTERISTICS: Concentrates both water and sediment to one common point low in the unit.

PARENT MATERIAL GROUP

This group consists of micaceous schists, gneisses, and interbedded pegmatites of the Belt Supergroup. Parent material is commonly referred to as the high grade metamorphics of the Border Zone.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,800 feet on low energy slopes. Soil profiles are 60+ inches deep. Surface soil is volcanic ash 7 to 23 inches thick. Subsurface soil is coarse textured with 20 to 60% rock fragments and an estimated 10 to 20% mica content.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 14" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 7 to 23" thick).

Subsoil - 14 to 32" brown gravelly sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 20 to 60% rock fragments, (range 10 to 40" thick).

Substratum - 32 to 60"+ pale brown sandy loam, structureless, nonsticky, nonplastic, 20 to 60% rock fragments.

SOIL CLASSIFICATION - Typic Vitrandepts, medial/loamy-skeletal, mixed, frigid; Eutric Gossoboralfs, coarse-loamy, mixed, frigid; and Andic Dystrochrepts, loamy-skeletal, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Ash cap mixing is common on steeper slopes. Shallow soils are associated with rock outcrops. Soils with finer textured subsoils (alfisols) commonly occur in moist draws.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is western red cedar/pachistima (THPL/PAMY). Some western hemlock (TSME/PAMY) units occur on the Palouse.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a very high mass wasting potential and sediment delivery efficiency. Other ratings are low to moderate.

ENGINEERING - Potential road construction problems include a very high mass wasting hazard and sediment delivery to streams. Cutbank and fill sloughing are maintenance problems.

SILVICULTURE - There are no major silvicultural limitations associated with this landtype.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate for summer and winter habitat. The winter rating applies to low elevations where snow accumulations do not limit access.



LANDTYPE 63-S26



SUMMARY

Number of delineations - 18
Total acreage - 1,350
Average map unit acreage - 75

These units are located on low elevation, warm aspect, stream headlands. Soils are moderately deep, somewhat excessively drained, and are developed in micaceous schist parent material. The habitat type is grand fir/pachistima or Douglas-fir/ninebark.

LANDFORM 63 STREAM HEADLANDS

Overall relief is typified by very steep stream headlands which occur in the upper parts of drainages. This landform generally has several first order drainages converging together.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 4,000 to 4,800 feet
- B. Slope Gradient - Predominantly 60+% with steepest gradients near the upper margin and lowest gradients in the lower margins
- C. Slope Shape - Concave both vertically and horizontally, inverted disc shape
- D. Overall Relief - 250 to 1,000 feet
- E. Dissection Spacing - Merging
- F. Dissection Relief - 10 to 100 feet
- G. Dissection Density - 4 to 6 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Pinate

STREAM DENSITY: 3-7 miles/mile²
MEAN: 4.25 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (100%)

CHANNEL TYPE: Steep with little grading, runs through colluvial material but with bedrock control, high energy, weak development except low in the unit.

SLOPE WATER MOVEMENT: Concentrated subsurface flows with streams forming in lower portion of unit. Seeps and springs are common.

SEDIMENT DELIVERY: Very high on slope and in channel, little storage capacity.

OTHER IMPORTANT CHARACTERISTICS: Concentrates both water and sediment to one common point low in the unit.

PARENT MATERIAL GROUP

This group consists of weathered micaceous schists with interbedded gneisses and pegmatites of the Belt Supergroup. These are commonly referred to as the high grade metamorphics of the Border Zone.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 4,800 feet on high energy slopes. Soils are 30 to 48 inches deep and tend to be droughty. Surface soil is mixed volcanic ash 3 to 16 inches thick. Subsurface soil is coarse textured with 10 to 50% rock fragments and an estimated 10 to 20% mica content.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 5" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 3 to 16" thick).

Subsoil - 5 to 36" brown gravelly sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 10 to 40% rock fragments, (range 10 to 40" thick).

Substratum - 36 to 48"+ pale brown gravelly sandy loam, structureless, nonsticky, nonplastic, 10 to 50% rock fragments.

SOIL CLASSIFICATION - Andic Dystrichrepts, loamy-skeletal, mixed, frigid, and Dystric Xerochrepts, loamy-skeletal, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Moderate depth, excessively well drained soils occur on ridges with deep well drained soils occurring in draws and swales. Shallow (lithic - <20") occur on sharp ridge points and in the vicinity of rock outcrops. Ash caps are usually mixed with and may have sandy loam textures.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is grand fir/pachistima (ABGR/PAMY) with Douglas-fir/ninebark occurring on thin dry soils and western red cedar in moist draws and along lower margins of the unit.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect high debris avalanche, and surface erosion potentials. Mass wasting potential and sediment delivery efficiency are rated high.

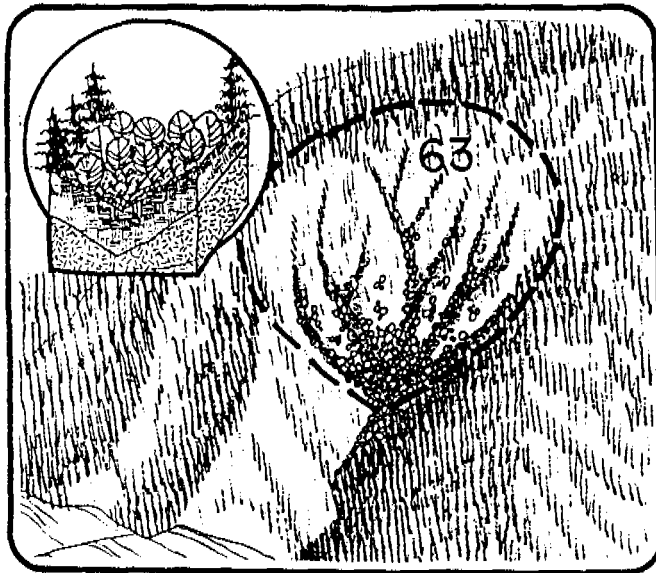
ENGINEERING - Potential road construction problems include a high mass wasting potential, debris avalanche potential, and subsoil erosion. There is a very high risk of sediment from these sources reaching streams. Dry cutbank raveling and cutbank sloughing are maintenance problems.

SILVICULTURE - The major silvicultural limitations are droughty soils, shallow ash surface soils, and high insolation rates.

POTENTIAL WILDLIFE HABITAT - The potential summer habitat is rated low because of high energy, high insolation conditions on steep, high energy slopes. Potential winter habitat is rated moderate at low elevations where snow accumulation does not limit accessibility.



LANDTYPE 63-S44



SUMMARY

Number of map delineations - 14
Total acreage - 600
Average map unit acreage - 43

These units are located on low elevation, stream headlands. Soils are well drained on ridges, poorly drained in stringer areas, and have deep profiles developed in micaceous schist parent material. The habitat type is western red cedar/pachistima with riparian vegetation in wet stringer areas.

LANDFORM 63 STREAM HEADLANDS

Overall relief is typified by very steep stream headlands which occur in the upper parts of drainages. This landform generally has several first order drainages converging together.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 3,500 to 5,000 feet
- B. Slope Gradient - Predominantly 60+% with steepest gradients near the upper margin and lowest gradients in the lower margins
- C. Slope Shape - Concave both vertically and horizontally, inverted disc shape
- D. Overall Relief - 250 to 1,000 feet
- E. Dissection Spacing - Merging
- F. Dissection Relief - 10 to 100 feet
- G. Dissection Density - 4 to 6 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Pinate

STREAM DENSITY: 3-7 miles/mile²
MEAN: 4.25 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (100%)

CHANNEL TYPE: Steep with very little grading, runs through colluvial material, but with bedrock control, high energy, weak development except low in the unit.

SLOPE WATER MOVEMENT: Concentrated subsurface flows with high water tables over much of the lower two-thirds of the unit with common seeps and springs.

SEDIMENT DELIVERY: Very high on slope and in channels, little storage capacity.

OTHER IMPORTANT CHARACTERISTICS: Concentrates both water and sediment through one common point low in the unit.

PARENT MATERIAL GROUP

This group consists of micaceous schists, gneisses, and interbedded pegmatites of the Belt Supergroup commonly referred to as high grade metamorphics of the Border Zone.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations below 5,000 feet on all aspect slopes. Soil profiles are 60+ inches deep. Well drained ridge soils have a volcanic ash surface 7 to 23 inches thick. Poorly drained stringer soils have a darkened, modified volcanic ash surface 5 to 12 inches thick. Subsurface soil is coarse textured with 30 to 50% rock fragments and an estimated 10 to 20% mica content. Naturally dense fragipan layers may occur in stringers, resulting in perched water.

TYPICAL SOIL PROFILES

(Well drained soil)

Surface Soil - 0 to 14" dark brown silt loam with weak granular structure, nonsticky, nonplastic, (range 7 to 23" thick).

Subsoil - 14 to 36" brown gravelly sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 30 to 50% rock fragments, (range 11 to 39" thick).

Substratum - 36 to 60"+ pale brown gravelly sandy loam, structureless, nonsticky, nonplastic, 30 to 50% rock fragments.

(Poorly drained soil)

Surface Soil - 0 to 8" very dark brown silt loam with weak subangular blocky structure, nonsticky, nonplastic, (range 5 to 12" thick).

Subsoil - 8 to 22" dark greyish brown gravelly silt loam with weak subangular blocky structure, nonsticky, nonplastic, 30 to 50% rock fragments, (range 10 to 30" thick).*

Substratum - 22 to 60"+ pale brown gravelly sandy loam, structureless, nonsticky, nonplastic, 30 to 50% rock fragments.*

*NOTE: These horizons may have a naturally dense (fragipan) characteristic which can cause perching of water, resulting in poor drainage.

SOIL CLASSIFICATION - Typic Vitrandepts, medial/loamy-skeletal, mixed, frigid; Andic Dystrochrepts, Toamy-skeletal, mixed, frigid; and Eutric Glossoboralfs, coarse-loamy, mixed, frigid.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS -

VEGETATIVE CHARACTERISTICS - The dominant habitat type on well drained sites is western red cedar/pachistima (THPL/PAMY). Poorly drained stringers have alder, fern, and sedge vegetation.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a very high mass wasting potential and slope sediment delivery efficiency. Other ratings are low to moderate.

ENGINEERING - Potential road construction problems are associated with wet areas and include a very high mass wasting hazard and sediment delivery to streams. Cutbank and fill sloughing as well as rapid brush encroachment are maintenance problems.

SILVICULTURE - Silvicultural limitations for this landtype are related to severe brush competition, high water tables, and dark colored umbric soils, all of which are dominant in wet stringer areas. Soil compaction potential is also rated high in wet parts of this unit. Ridges and other well drained portions of this landtype have few silvicultural limitations.

POTENTIAL WILDLIFE HABITAT - This landtype is rated high for potential summer and winter habitat because of available food, water, cover, and diversity. The winter rating applies only to low elevations where snow accumulations do not limit access.



LANDTYPE 63-U80



SUMMARY

Number of map delineations - 23
Total acreage - 1,350
Average map unit acreage - 59

These units are located on high elevation, warm aspect, stream headlands. Soils are moderately deep, excessively drained and are developed in undifferentiated parent material. The habitat type is subalpine fir/beargrass.

LANDFORM 63 STREAM HEADLANDS

Overall relief is typified by very steep stream headlands which occur in the upper parts of drainages. This landform generally has several first order drainages converging together.

LANDFORM PHYSICAL CHARACTERISTICS

- A. Elevation Range - 4,000 to 4,800 feet
- B. Slope Gradient - Predominantly 60+% with steepest gradients near the upper margin and lowest gradients in the lower margins
- C. Slope Shape - Concave both vertically and horizontally, inverted disc shape
- D. Overall Relief - 250 to 1,000 feet
- E. Dissection Spacing - Merging
- F. Dissection Relief - 10 to 100 feet
- G. Dissection Density - 4 to 6 miles/mile²

SLOPE HYDROLOGY

DRAINAGE PATTERN: Pinate

STREAM DENSITY: 3-7 miles/mile²
MEAN: 4.25 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (100%)

CHANNEL TYPE: Steep with little grading, runs through colluvial material but with bedrock control, high energy, weak development except low in the unit.

SLOPE WATER MOVEMENT: Concentrated subsurface flows with streams forming in lower portion of unit. Seeps and springs are common.

SEDIMENT DELIVERY: Very high on slope and in channel, little storage capacity.

OTHER IMPORTANT CHARACTERISTICS: Concentrates both water and sediment to one common point low in the unit.

PARENT MATERIAL GROUP

This group consists of weathered undifferentiated parent material.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations above 4,800 feet on high energy slopes. Soil profiles are 30 to 48 inches deep and are droughty. Surface soil is mixed volcanic ash 5 to 13 inches thick. Subsurface soil is coarse textured with 20 to 60% rock fragments.

TYPICAL SOIL PROFILE

Surface Soil - 0 to 10" dark brown or brown silt loam to sandy loam with weak granular structure, nonsticky, nonplastic, 20 to 50% rock fragments, (range 5 to 13" thick).

Subsoil - 10 to 28" pale brown gravelly sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 20 to 60% rock fragments, (range 15 to 30" thick).

Substratum - 28 to 48" light yellowish brown very gravelly sandy loam, structureless, nonsticky, nonplastic, 35 to 60% rock fragments.

SOIL CLASSIFICATION - Dystric and Andic Cryochrepts, loamy-skeletal, mixed, families.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - The soils in this group are approximately 85% skeletal and 15% nonskeletal.

VEGETATIVE CHARACTERISTICS - The dominant habitat type is subalpine fir/beargrass (ABLA/XETE).

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect high debris avalanche and surface erosion potentials as well as a very high sediment delivery efficiency.

ENGINEERING - Potential road construction problems include high debris avalanche hazards and very high sediment delivery to streams.

SILVICULTURE - Silvicultural limitations are related to droughty soils, large percentages of surface rock fragments, and high insolation rates. Prescribed fires should be of light intensity on this unit to preserve organic matter and avoid soil erosion.

POTENTIAL WILDLIFE HABITAT - This landtype is rated moderate as summer habitat and low for winter habitat due to excessive snow depths and inaccessibility.



LANDTYPE 63-U92



SUMMARY

Number of map delineations - 92
Total acreage - 6,800
Average map unit acreage - 74

These units are located on high elevation, stream headlands. Soils are well drained on ridges, poorly drained in concave areas, and have deep profiles developed in undifferentiated parent material. The habitat type is subalpine fir/pachistima with riparian vegetation in wet concave areas.

LANDFORM 63 STREAM HEADLANDS

Overall relief is typified by very steep stream headlands which occur in the upper parts of drainages. This landform generally has several first order drainages converging together.

PHYSICAL LANDFORM CHARACTERISTICS

- A. Elevation Range - 3,500 to 4,800 feet
- B. Slope Gradient - Predominantly 60+% with steepest gradients near the upper margin and lowest gradients in the lower margins
- C. Slope Shape - Concave both vertically and horizontally; inverted disc shape
- D. Overall Relief - 250 to 1,000 feet
- E. Dissection Spacing - Merging
- F. Dissection Relief - 10 to 100 feet
- G. Dissection Density - 4 to 6 miles/mile² with it.

SLOPE HYDROLOGY

DRAINAGE PATTERN: Pinate

STREAM DENSITY: 3-7 miles/mile²
MEAN: 4.25 miles/mile²

PRIMARY STREAM ORDER: 1 and 2 (100%)

CHANNEL TYPE: Steep with very little grading, runs through colluvial material, but with bedrock control, high energy, weak development except low in the unit.

SLOPE WATER MOVEMENT: Concentrated subsurface flows with high water tables over much of the lower two-thirds of the unit with common seeps and springs.

SEDIMENT DELIVERY: Very high on slope and in channels, little storage capacity.

OTHER IMPORTANT CHARACTERISTICS: Concentrates both water and sediment through one common point low in the unit.

PARENT MATERIAL GROUP

This group consists of material from the Belt quartzites, the Idaho Batholith granites and mixed glacial tills. In this undifferentiated bedrock group, lithology does not influence basic interpretive criteria.

SOIL-VEGETATIVE UNIT

This unit occurs at elevations above 4,800 feet and is a poorly to well drained unit with both soil and vegetative mosaic patterns. Soils are deep and high water tables may be present in concave depression areas. Such areas support alder, fern and sedge vegetation, and comprise at least 33% of the area. Well drained soils have dark colored surface soils. Subsoils are medium textured (sandy loam) and rock fragment content is variable. Total soil depth is 60"+.

TYPICAL SOIL PROFILES

(Well drained soil)

Surface Soil - 0 to 14" dark brown silt loam with weak granular structure, nonsticky, nonplastic (range 8 to 16" thick).

Subsoils - 14 to 36" brown gravelly sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 30 to 40% rock fragments, (range 20 to 30" thick).

Substratum - 36 to 60"+ light brown gravelly sandy loam structureless, nonsticky, nonplastic, 30 to 50% rock fragments.

(Poorly drained soil)

Surface Soil - 0 to 14" very dark brown silt loam with weak subangular blocky structure, nonsticky, nonplastic (range 7 to 30" thick).

Subsoil - 14 to 30" dark greyish brown gravelly sandy loam with weak subangular blocky structure, nonsticky, nonplastic, 20 to 60% rock fragments (range 15 to 30" thick).*

Substratum - 30 to 60"+ pale brown gravelly sandy loam, structureless, nonsticky, nonplastic, 20 to 60% rock fragments.*

*NOTE: These horizons may have a naturally dense (fragipan) layer which can cause perching of water and poor drainage.

SOIL CLASSIFICATION - Entic Cryandcepts, medial/loamy-skeletal, mixed, and Typic Cryumbrepts, Toamy-skeletal, mixed.

SOIL DISTRIBUTION, VARIATIONS, AND INCLUSIONS - Poorly drained soils occur in concave depression areas.

VEGETATIVE CHARACTERISTICS - The dominant habitat type on well drained sites is subalpine fir/pachistima (ABLA/PAMY). Poorly drained depressions have alder, fern, and sedge vegetation. Timber normally occurs as clumps in this unit.

MANAGEMENT CONSIDERATIONS

WATERSHED - Watershed interpretations reflect a high mass wasting potential and a very high sediment delivery efficiency.

ENGINEERING - Potential road construction problems are associated with wet areas and include a high mass wasting hazard as well as a very high sediment delivery into streams. Cutbank and fill sloughing as well as brush encroachment are maintenance problems.

SILVICULTURE - Silvicultural limitations for this unit are related to high seasonal water tables, severe brush competition and dark colored umbric soils, all of which occur in wet concave areas.

POTENTIAL WILDLIFE HABITAT - This landtype has properties such as food, water, cover, and vegetative diversity which are important components of wildlife habitat and is rated as having high potential as summer habitat. Because of inaccessibility during periods of snow accumulation, the rating for winter potential is low.



INTERPRETATIONS

Interpretations presented in this report are intended to aid the user in predicting the response of landtypes to various types of management activities. They are intended to be used as guides for various levels of planning down to, and including, early stages of project planning. They should not be used to make detailed project plans or decisions until they have been field checked and verified.

WATERSHED INTERPRETATIONS

The Clearwater National Forest comprises a major part of the watershed area which contributes to the Clearwater River drainage system. The headwater streams within this survey area are important spawning habitat for steelhead and chinook salmon. Resident fish populations include eastern brook trout, cutthroat trout and rainbow trout. Downstream, water uses are comprised mostly of hydroelectric power generation, irrigation, and recreation. Thus, maintaining water quality by controlling erosion and sediment is an objective of Forest management.

Under natural conditions, these Forest watersheds produce sediment at estimated rates of 10 to 100 tons per square mile per year. Generally, natural sediment is produced by stream channels.

When the soils are disturbed by runoff, surface erosion and mass wasting can occur. The extent to which transported soil particles become sediment depends, in part, on properties of the landform. In describing which landform characteristics play a role in sediment transport, the term sediment delivery efficiency is used to predict how effectively sediment is transported from the source to streams and rivers.

Stability interpretations do not necessarily indicate the magnitude of a problem, but they do indicate the likelihood of the problem. Landtypes are not homogeneous units of land; they have a range of characteristics. A landtype with a high rating for overland flow erosion does not mean that erosion is occurring evenly over the landtype at a rate more severe than that occurring evenly over a landtype rated low. It does mean, however, that severe erosion is more likely to occur on landtypes rated high than those rated low. Also, it must be remembered that all landtypes may contain inclusions of lands that have different characteristics than those of the mapped landtype. The occurrence and analysis of inclusions must be field verified before project decisions can be made.

This watershed interpretation section presents the rationale used to rate these dominant slope erosion processes on the Clearwater National Forest. These ratings are used as a basis for analyzing the relative stabilities of small watersheds and the acceleration of these processes by management practices. The framework for the interpretation is presented in tabular form in which the landtype properties are described and the potential ratings are divided into relative classes.

Ratings are adjusted for some landtypes with unique properties or where erosional processes repeatedly observed in the field are not explained by the properties listed in the tables.

Erosion potentials for landtypes are rated for undisturbed surface soils, severely disturbed surface soils or subsoils, and exposed substratum layers.

Surface Erosion Potential

The surface erosion potential rating considers raindrop splash and overland flow erosion on soils bared of vegetation, but which retain the root mat and soil structure. This rating is intended for use in predicting surface soil erosion which occurs following broadcast burning or wildfires. Landtype properties used to make these ratings are (1) volcanic ash topsoil characteristics, (2) slope gradient, (3) depth to restricting layers, and (4) slope shape. Volcanic ash plays an important role in the surface erosion rating since this material is extremely permeable, and is seldom associated with overland flow.

Table 1 lists landtype properties and rating classes for surface soil erosion potential.

Notable exceptions to this chart are high elevation ridges and upper slopes where surface erosion has been repeatedly observed, especially in areas burned by wildfires. Landtypes containing compacted tills are also rated higher than indicated on the table, since frequent occurrences of overland flow have been observed during spring snow melt. Landtypes occurring on the west edge of the Palouse District, where soils are developed in loess and lack an ash cap, are rated one class higher than indicated in table 1.

Table 1 - LANDTYPE PROPERTIES USED TO RATE UNDISTURBED SURFACE SOIL EROSION POTENTIAL

Property	Potential Classes			
	Low	Moderate		High
Ash Cap	>7" Thick	<7" Mixed	Ash Missing	Ash Missing
Slope Gradient	Variable	>60%	40 to 60%	>60%
Depth to Restrictive Layer	Variable	20 to 40"	20 to 40"	<20"
Slope Shape	Variable	Straight	Concave & Straight	Concave & Straight

Subsoil Erosion Potential

The subsoil erosion potential rating considers raindrop splash and overland flow where the subsoil has been exposed or where the surface soil has been severely disturbed and mixed with the subsoil. This rating is intended to predict erosion which occurs following shallow soil disturbance and displacement. Excavated skid trails, fire lines, and high lead yarding corridors can result in this type of erosion. Landtype properties used to make this rating are, (1) slope gradient, (2) depth to restricting layer, and (3) subsoil texture.

Table 2 lists the landtype properties and rating classes for subsoil erosion potential.

Exceptions to the ratings in table 2 include soils derived from ancient alluviums, Palouse loesses, gussic granitics, and decomposed Revett quartzites. Field observations indicate these particular soils have high potential for erosion due to their graded particle size distributions.

Table 2 - LANDTYPE PROPERTIES USED TO DETERMINE SUBSOIL EROSION POTENTIAL

Property	Potential Classes							
	Low		Moderate			High		
Slope %	<40%	40 - 60%	<40%	40 - 60%	60%+	40 - 60%	60%+	
Depth to Restrictive Layer	>20"	>40"	<20"	20 - 40"	>40"	<20"	<40"	
Subsoil Texture	Clay loams, skeletal textures finer than 1s	All	s1, 1s alluvium and loess silts	s1, 1s	All	All	All	

Substratum Erosion Potential

The substratum erosion potential rating considers raindrop splash and overland flow erosion which occur in deep excavations such as roads and skid trails. Factors used to make this rating include parent material characteristics such as bedrock weathering, rock fragment content, and substratum permeability. Table 3 lists the landtype parent material properties and the classes for substratum erosion potential. Landtypes which have an observed tendency to intercept and concentrate subsurface water in major excavations have been rated one class higher than table 3 would indicate.

Table 3 - LANDTYPE PROPERTIES USED TO RATE SUBSTRATUM EROSION POTENTIAL

Parent Material Type	Potential Classes			
	Low	Moderate	High	Very High
	Skeletal parent materials including glacial tills and weakly weathered granitics, quartzites	Moderately weathered skeletal siltites and granitics, deeply weathered schists, gniesses, and basalts	Silty alluviums and Palouse silts. Deeply weathered non-skeletal G series granitics and deeply weathered R series Revett quartzites	Decomposed gussic granitics (all K series)

Mass Wasting Potential

The mass wasting potential rating evaluates the relative potential for mass soil movement caused by gravitational forces. Activities such as timber harvest, road construction, and fire have the potential to accelerate mass movement. Landtypes which are susceptible to mass wasting may require special engineering techniques, timber sale prescriptions, logging system layouts, and prescribed burning plans.

The most common forms of mass wasting on the Clearwater are (1) rotational mass wasting, and (2) debris avalanches. The ratings for landtypes consider the potential for natural as well as accelerated mass movement resulting from management activities.

Rotational Mass Wasting

Rotational mass wasting is the movement of the regolith as a coherent mass, usually with a backward tilting motion. Slippages involve subsurface water concentrations. Hard bedrock does not constitute the slippage plane. Factors used to rate the potential for mass wasting are based on the inventory and measurement of some 700 landslides occurring on the Forest in 1974 - 1976.

Landtype properties used to rate rotational mass wasting potential are (1) slope gradient, (2) presence of concentrated subsurface ground water using slope dissection and water table presence, (3) substratum texture, (4) regolith depth, and (5) presence of mica.

Table 4 lists the landtype properties and rating classes for rotational mass wasting potential.

Landtypes which are identified as having a history of mass movement are placed in the mass wasted landform (landtype 50) group. These landtypes are variable and require investigation in the field. Because of historic instability, these landtypes are rated as having high mass wasting potential. Some high elevation landtypes are rated one class lower than indicated on table 4 because late winter or early spring rain or snow and snow melt events are much less frequent and because the frost churning increases the internal strength of the soil mantle. Landtypes developed in weakly weathered quartzites are rated one class lower than indicated in table 4.

Table 4 - LANDTYPE PROPERTIES USED TO RATE ROTATIONAL MASS WASTING POTENTIAL

Property	Low		Moderate				High			Very High		
	<40%	40 - 60%	<40%	40 - 60%	60%	40 - 60%	60%	60%	60%	60%		
Slope Gradient												
Dissections	Dissected Dry		Wet Dissections	Dissections	Dissected	Dissected Nondissected	Wet Dissection	Dissected	Nondissected	Dissected	Dissected	Wet Dissected
Texture	All	sl & ls	All	All	sl & ls	All	All	sl & heavier	All	sl & ls	sl & heavier	All
Regolith Depth	All	<60"	>60"	>60"	>60"	<60"	>60"	>60"	>60"	>60"	>60"	>60"
Presence of Mica	All	No	All	Yes	No	No	All	Yes	All	No	Yes	All

Debris Avalanche

Debris avalanche mass wasting is characterized by rapid and usually sudden downslope movement of initially consolidated debris. The slippage plane is usually hard bedrock. Debris avalanches often turn into mud flows as they move down slope and accumulate soil material. The landslide inventory of 1974-1976 identified several landtype properties which are associated with debris avalanches, and these are used to rate the potential for debris avalanches. These properties include (1) slope gradient, (2) slope shape, (3) topsoil texture, and (4) the occurrence of old slidescars and accumulations of debris at the slope base. Table 5 lists the landtype properties and rating classes for debris avalanche potential.

Table 5 - LANDTYPE PROPERTIES USED TO RATE DEBRIS AVALANCHE POTENTIAL

Property	Low		Moderate		High	
	<40%	40 - 60%	40 - 60%	60%+	60%+	60%+
Slope	<40%	40 - 60%	40 - 60%	60%+	60%+	60%+
Slope Shape	Variable	Convex	Convex & Straight	Concave & Straight	Concave	Straight
Topsoil Texture	Variable	cl & sil	sl & ls	sil & l	sl & ls	sl & ls
Occurrence of old slidescars	Rare	Rare	Common	Common	Many	Many

Slope Sediment Delivery Efficiency

Slope sediment delivery efficiency is the ability of a landtype to deliver sediment produced on site from the source to streams. The delivery efficiency rating reflects the delivery of naturally produced sediment on slopes as well as the acceleration of mass movement through management activities. Landtype properties used to make this rating include (1) slope gradient, (2) slope dissection, and (3) slope shape.

Table 6 lists landtype properties and rating classes for slope sediment delivery efficiency. Exceptions to the ratings in table 6 occur where steep slopes, which ordinarily would have high delivery ratings, are separated from streams by low gradient depositional areas. Examples include steep glacial trough walls (Landforms 48, 49) which are separated from major streams in valley bottoms by a broad expanse of valley trail glacial till in the trough bottom. Other exceptions include floodplain, bottomland, and recent terrace landforms (Landform 10, 11) which, because of their unique position in close proximity to major streams and rivers, have a high potential for sediment delivery.

Table 6 - PROPERTIES USED TO RATE SLOPE SEDIMENT DELIVERY EFFICIENCY

Property	Low		Moderate		High		Very High
	<20%	20 - 40%	40 - 60%	40 - 60%	40 - 60%	60+	60+
Slope %	<20%	20 - 40%	40 - 60%	40 - 60%	40 - 60%	60+	60+
Slope Dissection	All	Weak	High	Weak	Dissected	Nondissected	Dissected
Slope Shape	Flat & Compound	Convex	Compound	Convex	Straight & Concave	Straight	Straight & Concave

Slope sediment delivery efficiency is increased when roads are constructed in steep, mountainous terrain. Road prisms are designed to be efficient transporters of sediment. Slope gradients on cuts and fills are significantly steeper than the natural slopes, and this excavated road prism increases overland flow and thus, sediment production. Road prisms effectively increase the drainage density of a landform by adding the channeling of ditches and road surfaces. Increases in sediment delivery efficiency can be estimated by using the average distance of the road from a line stream along with the dissection density which determines the number of drainage crossings.

ENGINEERING INTERPRETATIONS

Roading Suitability

Roading suitability refers to watershed risks associated with road construction in the various landtypes. It is a combination of potential onsite erosion with the slope sediment delivery efficiency. This assumes that mass erosion and road prism rill and sheet erosion play a role of equal importance in stream sedimentation. Actually the role of the two sediment sources will vary according to landtype. However, it has been shown that very high sediment rates from either source can cause severe watershed damage. The following assumptions are used as a base for rating road suitability.

1. Road suitability is the ability of the land to support construction of a "basic road" without large failures of cut and fill slopes, without severe surface erosion of the road prism, and without allowing material to reach stream courses if such damages occur. It presumes a road is located, designed, constructed without any special precautions (such as binwalls, flatter cut slopes, hand planting to revegetate slopes, etc.) to prevent landslides or surface erosion, except as stated in the "basic road" definition. Construction costs are not considered in road capability, nor are such factors as wildlife and esthetics considered.

2. The "basic road" is defined as a 14' subgrade, 3/4:1 cut slope, 1 1/3:1 fill slope, with uncompacted fills, no surfacing, and where needed, ditches, curve widening, and turnouts. All clearing slash is removed from the road prism. On the sideslopes, balanced construction is practiced as much as possible. Grass is seeded on exposed soil by hydro or hand.

3. Potential impacts and probabilities of encountering problems increase with greater road widths, stricter alignment standards or when roads are constructed on steeper slopes. Impacts and problems also increase where the quality of road construction is below that for the "basic road". Ratings for a landtype use landtype characteristics that are average or typical for that landtype. Considerable variations in roading capability exist within any given landtype, and must be fully considered in detailed planning.

Road suitability rating class is determined by combining the rotational mass wasting potential and debris avalanche potential (which ever is highest) and substratum erosion hazard with slope delivery efficiency. The resulting roading suitability classes are defined as follows:

A. Roading Suitability Classes

Class 5 - Virtually no risk of landslides and/or surface erosion with very low potential of material reaching stream courses. Consequences of mistakes are minor and easily corrected.

Class 4 - Low risk of landslides and/or erosion with low potential of material reaching stream courses. Risk can usually be almost eliminated by careful roadbuilding practices. Consequences of mistakes are seldom severe, and can be corrected.

Class 3 - Moderate risk of landslides and/or surface erosion with moderate potential of material reaching stream courses. Reduction of risk is possible, although it may be costly. Mistakes may have severe consequences, but can usually be corrected.

Class 2 - High risk of landslides and/or surface erosion, with some material reaching stream courses. Reduction of risk is difficult and costly. Mistakes usually have severe consequences, and are difficult to correct.

Class 1 - Extremely high risk of landslides and/or erosion, with material reaching stream courses. Reduction of risk is very difficult, and are often not possible. Mistakes have severe consequences, and are often impossible to be corrected.

B. Road Construction Cost Class

This rating is intended to enable transportation planners to compare cost of a "standard road" built on various landtypes. Average cost per mile of road in a landtype using 1) slope gradient 2) slope dissection density 3) soil mantle (regolith) depth 4) percentage rippable material 5) cost of measures necessary to overcome mass wasting hazard and 6) cost of measures necessary to overcome surface erosion, for that landtype. Costs are in 1982 dollars and are given in 5 classes. A rating of class 1 is given to landtypes with the lowest construction cost and a rating of class 5 is given to landtypes with the highest construction cost. Classes use a geometric progression of costs with a common ratio of 1.54. Road construction cost classes for the "basic road" in \$1000's/mile are:

Class 1 - 21.1 to 31.9

Class 2 - 32.0 to 48.2

Class 3 - 48.3 to 72.8

Class 4 - 72.9 to 109.9

Class 5 - 110.0 to 166.1

Road Maintenance Interpretations

The major soil characteristics effecting road maintenance are road prism erosion and trafficability.

Road prism erosion is evaluated using parent material erosion hazard rating.

C. Trafficability

This rating is designed to predict which soil types are susceptible to damage due to heavy machinery traffic under wet conditions. This rating is general in nature and considers soil texture, coarse fragment content, and size of coarse fragments. This rating defines the susceptibility of road surfaces to rutting and traction problems if used when wet. Most soils on the Forest have a one to two-foot thick ash cap. This material should not be used as running surface material because of its extremely low bearing strength and tendency to dust. Only the characteristics of the subsoils and parent materials are used in this rating. Classes are:

Good - Loamy skeletal textural families with coarse fragments 3/4" diameter and larger and treads built in hard well fractured bedrock. Contains unified texture classes GW, GC, & SW.

Fair - Coarse loamy, sandy and loamy skeletal textural families with coarse fragments less than 3/4" diameter. Contains unified texture classes GP, SP, GM, & SM.

Poor - Other finer textured non-skeletal soils. Contains unified texture classes CL, ML, MH, & CH.

D. Other Road Maintenance Factors

Several other factors influencing road maintenance are listed by designated landtype but are not rated. The listing should be considered when making road maintenance evaluations for landtypes. Additional listed factors are:

1. Cutbank Sloughing - Refers to relatively small slumps, usually less than 10 cubic yards, which remain on the road. Characteristics conducive to cutbank sloughing are: Deep silty soils, deep unconsolidated deposited soils, soils with fragipans and mapping units with common high water tables.
2. Dry Cutbank Raveling - Refers to single particle detachment and ravel. Grussic granitic soils are the primary source of this problem.
3. Rapid Brush Encroachment is common on landtypes with common wet or very moist soil conditions and SAF/Mefe and SAF/Pamy habitat types.
4. Fill Sloughing - Materials most conducive to fill sloughing are moderately and well weathered mica shists and coarse textured cohesionless materials from deeply weathered gniesses, granitics, and quartzites.
5. Tread wear in bouldery material - This refers to materials that contain large percentages of rounded and subrounded bouldery material. Heavily used roads in these materials with natural surfaces experience rapid cushion wear leaving very rough unbladeable surfaces.
6. Road tread erosion and rutting.
7. Severe dust problems - This is confined largely to soils with silty textures.

E. Rippability

Rippability ratings presented here are based on the type of parent material and the degree of weathering of residual parent material. Ratings are given in three general classes for excavation required for the "basic road" previously described.

Class 1 - Mostly rippable (>90%) - Includes all unconsolidated depositional and landforms 22 and 24 with deeply weathered parent material. (Seismic velocities <4500 feet per second)

Class 2 - 50 to 90% rippable - Includes landtypes with deep colluvial and frost churned mantles. Parent material weathering is variable. (Seismic velocities between 4,500 and 10,000 feet per second)

Class 3 - <50% rippable - Includes steep slopes with shallow mantles over weakly weathered parent material and glacially scoured areas with shallow mantles. (Seismic velocities 10,000 feet per second)

1. Unified Soil Classification

Unified ratings are listed for subsurface soil horizons (subsoil and substratum) to provide engineers with estimated soil properties which affect road construction. These ratings are based on soil textures and rock fragment content. Several ratings are given for a landtype where soils have a wide range of properties or where two or more distinct soil types occur within a landtype.

SILVICULTURE INTERPRETATIONS

Landtype Timber Productivity

Timber productivity classes used on the Clearwater National Forest are based on data obtained in the 1973 Forest Inventory. Yield classes are stratified by vegetative habitat types. This rating integrates productivity ranges established for habitat types with climate, soil moisture holding capacity, and overall soil fertility.

Class 1 - 225+ cubic feet/acre/year

Landforms 22 and 24 with soils derived from ancient alluvium and Palouse loess.

Class 2 - 165 to 224 cubic feet/acre/year

Landforms 22 and 24 with WRC/PAMY habitat types and soils with thick ash caps and developed from parent materials other than ancient alluvium and Palouse loess.

- Steep, northerly slopes with WRC/PAMY habitat types and deep colluvial soils.

Class 3 - 100 to 164 cubic feet/acre/year

- Steep southerly slopes below 5,000 feet elevation with deep colluvial soils and ash caps over 7 inches deep.

- Landtypes with SAF/PAMY habitat type.

- Landtypes occurring below 4,800 feet elevation having shallow fragipans (20 to 40 inches deep).

- Landtypes in low precipitation zones along the western fringes of the Palouse District.

- Landtypes below 4,800 feet elevation with 15 to 40% Umprepts and/or poorly drained soils.

Class 4 - Below 100 cubic feet/acre/year

- Landtypes with SAF/MEFE and SAF/XETE habitat types.

- Landtypes above 4,800 feet elevation with 15 to 40% Cryumbrepts and/or seasonal high water tables.

- Landtypes on steep southerly slopes containing at least 25% shallow, droughty soils and bedrock outcrop.

Class 5 - Noncommercial Forest Land

Landtypes placed in this category because of both low productivity and regeneration problems.

Regeneration Limitations

The following is a listing of recognized or suspected soil related regeneration problems common to the Clearwater National Forest. No attempt is made to rate the severity of the problem or suggest mitigation for the problem. This must be done on a site by site basis.

- A - No recognized inherent soil related regeneration problems.
- 1 - Shallow and/or droughty soils with bedrock outcrop.
- 2 - Soils with good soil moisture holding and fertility regimes, but in low precipitation zones on the western and southern edges of the Palouse District.
 - a - Landtypes with "umbric" soils occurring over a significant portion of the unit.
 - b - Seasonal or continuous high water tables occurring over a significant portion of the unit.
 - c - Severe climax brush, sod, or fern competition.
 - d - Large percentage of surface rock fragments.
 - e - High energy slopes with insolation problems.

Soil Sensitivity to Disturbance

Certain soils on the Forest have surface and underlying subsoil horizons which are highly contrasting in terms of physical and chemical properties. Where volcanic ash overlies grussic granitic subsoils, for instance, the ash is relatively fertile with good moisture holding properties, while the underlying sandy "grus" is essentially sterile and has a low moisture holding capacity. Such a soil could be significantly damaged if the topsoil was removed or displaced through tractor site preparation and site disposal. This sensitivity rating is designed to identify these soil types and consists of three classes listed below.

Low - Differences between surface soil and subsoil moisture holding capacity and fertility are minor. Surface soil disturbance is of little consequence in relation to productivity if subsoils are not compacted. Most landtypes in this rating class are alfisols derived from ancient alluviums, Palouse loess and deeply weathered schists.

Medium - Differences between surface soil and subsoil moisture holding capacity and fertility are significant. Severe surface soil mixing and/or removal could reduce long-term productivity.

High - Differences between surface soil and subsoil moisture holding capacity and fertility are major. This rating applies to landtypes where ash caps overlie decomposed granitics and quartzites, or have shallow (<20" deep) fragipans. It also applies to high elevation landtypes with excessively well drained subsoils.

Prescribed Burning Guides

These guides are designed to provide recommendations for prescribed burning on landtypes and are based primarily on the work of Al Harvey of the Intermountain Forest Experiment Station in Moscow, Idaho. The burning classes are designed to recommend fire intensities and residual fuel levels necessary to maintain a soil organic base adequate to sustain soil microbial populations at acceptable levels.

Class 1 - Deep moist soils on low energy slopes with WRC/PAMY habitat type.

Activity fuel load - 0 to 25 tons/acre

Fireline intensity - Up to 1,000 BTU's/sec/ft. with 8 to 11 feet flame lengths

Class 2 - Deep soils on high energy southerly slopes with WRC/PAMY habitat type.

Activity fuel load - 10 to 20 tons/acre

Fireline intensity - Up to 600 BTU's/sec/ft. with 4 to 8 feet flame lengths.

Class 3 - Shallow, droughty soils on high energy south slopes with GF/PAMY and DF habitat types.

Activity fuel load - 10 to 15 tons/acre

Fireline intensity - Less than 100 BTU's/sec/ft. with <4-foot flame lengths

Class 4 - High elevation soils with SAF/XETE habitat type.

Activity fuel load - 15 to 25 tons/acre leave duff

Fireline intensity - Less than 100 BTU's/sec/ft. with <4-foot flame lengths

Class 5 - High elevation soils with SAF/MEFE + PAMY habitat types.

Activity fuel load - Less than 10 tons/acre

Fireline intensity - Less than 600 BTU's/sec/ft. with 4 to 8 feet flame lengths

Logging Suitability Class

This is a general grouping of dominant slope and landform characteristics influencing the use of presently available and foreseeable skidding systems used on this Forest. Other limitations specific to a certain logging method such as soil compaction and wet areas may also occur in the landtype, but are listed as separate interpretations.

Class 1 - Weakly dissected or incised slopes with less than 40 percent gradients. This class is largely adapted to tractor type skidding methods.

Class 2 - Broken, dissected, low and moderate relief landforms with a variety of slope shapes and gradients. Combinations of short line and tractor systems are adaptable to these landforms.

Class 3 - Long, straight, and concave slopes with greater than 40 percent slope gradients generally suitable for midslope roads. Line systems using the midslope roads are adaptable to this class.

Class 4 - Long, straight, and concave slopes with greater than 40 percent slope gradients and are marginally suitable for high risk midslope road construction. Long line systems using ridgetop top or lower slope margin roads or aerial systems using no roads are adaptable to this class.

Windthrow Susceptibility Class

Windthrow is rated only as average and high. Landtype characteristics contributing to high windfall susceptibility are units with common high water tables and soils with fragipans.

SOIL COMPACTION

Forest managers are becoming increasingly aware that operating heavy equipment on Forest lands has the potential to compact surface soils. Problems associated with compaction include reduced water infiltration, reduced soil moisture retention, increased overland flow with related erosion, and the restriction of plant root growth.

The surface soils of the Clearwater National Forest are somewhat unique in that they often consist of volcanic ash which was deposited several thousand years ago. This ash topsoil is typically light, fluffy material with a low bulk density and a very high infiltration rate for water. On much of the Clearwater, the ash surface soil is greater than one-foot thick. Where the ash soil is relatively pure and undisturbed, bulk densities range from .65 to .85 grams/centimeter³, with an average value of about .75 grams/centimeter³.

Local studies designed to evaluate effects of tractor site preparations and slash disposal have shown that tractor operations increased the bulk density of pure ash to approximately .85 grams/centimeter³. In this case, the area was disturbed, but the ash was not displaced. In areas where the disturbed ash was less than 11 inches thick, bulk densities were increased to from .9 to 1.1 grams/centimeter³.

In an attempt to relate soil densities to tree growth, the Potlatch Corporation has conducted greenhouse seedling growth studies in soils with various levels of compaction. In these trials, soil bulk densities of .70, .95, and 1.2 grams/centimeter³ were used. Results showed that significant reductions in seedling root growth were observed in soil bulk densities of .95 grams/centimeter³ or greater.

Ash topsoil displacement and compaction in repeatedly used skid trails has been shown to result in soil densities which can inhibit seedling root growth. For this reason, it is recommended that designated skid trails be used with spacings of at least 100 feet. Such a system should reduce widespread compaction which results from uncontrolled broadcast skidding, thus reducing soil damage.

Tractor slash disposal and site preparation operations also have potential for surface compaction and displacement. In the local study, between 40 and 46 percent of total area was disturbed during slash disposal.

Soil density was closely related to degree of soil displacement. After all treatments, 30 percent of measured points had ash displaced to depths less than 11 inches. Bulk densities of ash less than 11 inches were increased 30 percent above those of undisturbed ash. Bulk densities of ash greater than 11 inches deep increased 12 percent over those for undisturbed ash. Bulk densities of .90 grams/centimeter³ were reached on two of three sites where disturbed ash depths were less than 11 inches in depth.

LANDTYPE INTERPRETATIONS

LANDTYPE	WATERSHED						ENGINEERING						SILVICULTURE					
	Mass Wasting Potential	Debris Avalanche Potential	Surface Erosion Potential	Subsoil Erosion Potential	Parent Material Erosion Potential	Slope Sediment Delivery Efficiency	Roading Suitability	Roading Construction Cost Class	Trafficability Class	Road Maintenance Factors	Rippability Class	Unified Soil Classification	Soil Productivity Class	Regeneration Limitations	Soil Sensitivity Class	Burning Class	Windthrow Class	Logging Method Class
10-A40	L	L	L	L	L	H	4	1	F	1,3,5,6	1	SM,SP,GP-GW	2 & 3	4,5	M	1	H	1
10-A90	L	L	L	L	L	H	4	1	F	1,3,5,6	1	SM,SP GP-GW	3	4,5	M	1	H	1
11-A40	L	L	L	M	H	L	3	2	P	3,6	1	CL,ML ML-CL	1	2,4	L	1	H	1
11-A47	L	L	L	M	H	L	4	1	P	1,3,6	1	CL,ML ML-CL	2	4	M	1	A	1
11-A97	L	L	L	L	H	L	4	1	P	1,3,5,6	1	ML, ML-CL	NA	NA	M	NA	NA	NA
13-A00	L&M	L	L	L	MH	L	4	2	P	1,3	1	ML,SM	1	---	M	1	A	1
15-U00	H	L	L	L	L	H	3	2	F	1,3	1	GW,SM SM-SC	2	---	M	1	A	Var
16-U96	H	M	M	L	L	H	2	3	G	1,6	1	SM,GW	NA	NA	M	NA	NA	NA
22-A00	L	L	L	H	H	L	3	1	P	6	1	ML, ML-CL	2	4	H	1	H	1
22-A01	L	L	L	H	H	L	3	3	P	1,6	1	ML, ML-CL	1	---	L	1	A	1
22-A02	L	L	M	H	H	L	3	3	P	1,6	1	MH,ML ML-CL	3	2,4	H	1	H	1
22-A03	L	L	M	H	H	L	3	3	P	1,6	1	ML, ML-CL	2	2,4	H	1	H	1
22-A06	L	L	L	H	H	L	3	3	P	1,6	1	ML, ML-CL	3	1,4	H	1	H	1
22-A07	L	L	M	H	H	L	3	3	P	1,6	1	ML, ML-CL	3	1,2,4	H	1	H	1
22-G00	L	L	L	L	H	L	3	3	F	2,6	1	SM,ML	2	---	M	2	A	1
22-G01	L	L	L	L	H	L	3	3	F	2,6	1	ML,SM SM-SL	1&2	---	H	1	A	1
22-G45	M	L	L	L	H	L	4	3	F	1,2,3,6	1	SM,ML	3	3,4,5	M	1	H	1
22-G95	M	L	L	L	M	L	4	2	F	1,2,3,6	1	SM, ML,OL	3	3,4,5	M	1	H	1
22-K00	L	L	L	H	VH	L	3	3	F	2,6	1	SM,SP	2	---	H	1	A	1
22-K45	M	L	L	H	VH	L	3	3	F	1,2,3,6	1	SM,SP	3	3,4,5	H	1	H	1

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LANDTYPE INTERPRETATIONS

LANDTYPE	WATERSHED						ENGINEERING						SILVICULTURE					
	Mass Wasting Potential	Debris Avalanche Potential	Surface Erosion Potential	Subsoil Erosion Potential	Parent Material Erosion Potential	Slope Sediment Delivery Efficiency	Roading Suitability	Roading Construction Cost Class	Trafficability Class	Road Maintenance Factors	Rippability Class	Unified Soil Classification	Soil Productivity Class	Regeneration Limitations	Soil Sensitivity Class	Burning Class	Windthrow Class	Logging Method Class
22-Q00	L	L	L	L	L	L	5	1	G	---	1	SM	2	---	M	1	A	1
22-Q01	L	L	L	L	L	L	5	1	F	---	1	SM, ML-CL	1	---	L	1	A	1
22-S00	L	L	L	L	M	L	4	1	P	1,4,6	1	SM, ML, MH	2	---	L	1	A	1
22-S01	L	L	L	L	M	L	4	1	P	6	1	ML	2	---	M	1	A	1
22-S45	M	L	L	L	M	L	4	2	F	1,3,4,6	1	SM, OL, ML-MH	3	3,4,5	L	1	H	1
22-T01	L	L	L	L	M	L	4	1	P	6	1	GC, CL	2	2	H	1	H	1
22-U25	L	L	M	L	M	L	4	1	F	6	1	ML, GM	3	1,2,5	H	1	A	1
23-G20	M	L	L	M	M	H	3	3	F	2	1&2	SM	3	2,7	M	1&2	A	2
23-K20	M	M	L	H	VH	H	2	3	F	2,6	1&2	SM, SP	3	2,7	H	1&2	A	2
23-S20	H	L	L	M	M	H	2	3	F	4	1&2	SM, ML	3	2,7	M	1&2	A	2
24-A01	L	L	L	H	H	M	3	2	P	1,6	1	ML, ML-CL	1	---	L	1	A	2
24-G10	L	L	L	L	H	M	3	3	F	2	1	SM	2	---	M	1	A	2
24-G20	L	L	L	L	H	M	3	3	F	2	1	SM	2	---	M	2	A	2
24-G45	M	L	L	M	H	M	3	3	F	1,2,3	1	SM	3	3,4,5	M	1	H	2
24-G95	M	L	L	M	M	M	4	2	F	1,2,3,6	1	SM, OL	3	3,4,5	M	5	H	2
24-K10	L	L	L	H	VH	M	2	3	F	2,6	1	SM, SP	2	---	H	1	A	2
24-K20	L	L	L	H	VH	M	2	3	F	2,6	1	SM, SP	3	---	H	1	A	2
24-K45	M	L	L	H	VH	M	2	3	F	1,2,3,4,6	1	SM, SP	3	3,4,5	H	1	H	2
24-Q10	L	L	L	L	L	M	4	2	F	---	1	SM, ML	2	---	M	1&2	A	2
24-Q20	L	L	L	L	L	M	4	2	G	---	1	SM, ML	3	1,2,5	M	2	A	1

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LANDTYPE INTERPRETATIONS

LANDTYPE	WATERSHED						ENGINEERING						SILVICULTURE					
	Mass Wasting Potential	Debris Avalanche Potential	Surface Erosion Potential	Subsoil Erosion Potential	Parent Material Erosion Potential	Slope Sediment Delivery Efficiency	Roading Suitability	Roading Construction Cost Class	Trafficability Class	Road Maintenance Factors	Rippability Class	Unified Soil Classification	Soil Productivity Class	Regeneration Limitations	Soil Sensitivity Class	Burning Class	Windthrow Class	Logging Method Class
24-Q25	L	L	L	L	L	L	3	2	G	---	1	ML,GM	3	1,2,5	M	2	A	2
24-Q45	M	L	L	L	L	M	3	2	F	3,4,5	1	SM,ML	3	3,4,5	M	1	H	2
24-R00	L	L	L	H	H	M	3	3	P	1,4,6	1	SM,ML	2	---	H	1&2	A	2
24-R45	M	L	L	H	H	M	3	3	P	1,3,4,6	1	SM,ML,OL	3	3,4,5	H	1	H	2
24-S10	M	L	L	L	M	M	3	2	F	1,4	1	SM,ML,MH	2	---	L	1	A	2
24-S20	M	L	L	L	M	M	3	2	F	1,4	1	SM,ML,MH	2	---	M	2	A	2
24-S25	M	L	L	L	M	L	3	2	F	3	1	SM,ML	3	1,2,5	M	2	A	2
24-S45	H	L	L	M	M	M	3	2	P	1,3,4,6	1	SM,ML,MH,OL	3	3,4,5	M	1	H	2
24-T01	L	L	L	L	M	L	3	2	P	1,6	1	GM	3	2	L	2	H	2
24-T11	L	L	L	L	M	M	4	2	P	6	1	CL,ML-CL	1	---	L	1	A	2
24-T21	L	L	L	M	M	L	3	2	P	1,6	1	CL,ML-CL	2	2	M	1	H	2
24-T25	L	L	L	M	M	L	3	2	P	1,6	1	CL,ML-CL	3	1,2,5	L	3	H	2
24-U26	L	L	L	L	M	M	3	2	F	---	1	SM	4	1,2,5	L	3	A	2
31-G10	M	L	L	L	M	H	3	2	G	---	2	SM	2	---	M	1	A	3
31-G20	M	L	L	L	M	H	3	2	G	2	2	SM	3	7	M	2	A	3
31-G45	H	L	L	M	M	H	3	3	F	1,3	2	SM	3	3,4,5	M	1	H	3
31-K10	M	L	L	H	VH	H	2	3	F	2,6	1	SM,SP,GP	2	---	H	1	A	3
31-K20	M	L	L	H	VH	H	2	3	F	2,6	1	SM,SP,GP	3	7	H	2	A	3
31-K26	M	M	M	H	VH	H	2	3	F	2	2	SP,GP	3&4	1,6,7	H	3	A	3
31-Q10	L	L	L	L	L	H	4	2	G	---	2	SM,ML	2	---	M	1	A	3

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LANDTYPE INTERPRETATIONS

← WATERSHED →

← ENGINEERING →

← SILVICULTURE →

LANDTYPE	WATERSHED						ENGINEERING						SILVICULTURE					
	Mass Wasting Potential	Debris Avalanche Potential	Surface Erosion Potential	Subsoil Erosion Potential	Parent Material Erosion Potential	Slope Sediment Delivery Efficiency	Roading Suitability	Roading Construction Cost Class	Trafficability Class	Road Maintenance Factors	Rippability Class	Unified Soil Classification	Soil Productivity Class	Regeneration Limitations	Soil Sensitivity Class	Burning Class	Windthrow Class	Logging Method Class
31-Q20	L	L	L	L	L	H	4	2	G	---	2	SM,ML	3	7	M	2	A	3
31-Q25	L	M	L	L	M	M	3	2	G	4	2	SM,ML	2	1,2,5	M	3	A	3
31-R10	H	L	L	H	H	H	2	3	P	1,4,6	1	SM	2	---	H	1	A	3
31-R20	M	L	L	H	H	H	2	3	P	1,4,6	1	SM	3	7	H	2	A	3
31-S10	H	L	L	L	M	H	3	3	F	1,4	2	SM,ML	2	---	M	1	A	3
31-S20	H	L	L	L	M	H	3	3	F	1,4	2	SM,ML	3	7	M	2	A	3
31-S21	H	L	L	L	M	M	3	3	G	4	2	SM,GW	2	5,7	M	2	A	2
31-S25	H	L	L	M	M	M	3	3	F	1,4,6	2	SM,GW	3	1,2,5,7	M	3	A	3
31-S45	H	L	L	L	M	H	2	3	F	1,3,4,6	2	SM,ML	3	3,4,5	M	1	H	3
31-T10	M	L	L	L	M	M	3	2	F	---	2	CL,GC ML-CL	2	---	M	1	A	3
31-T20	M	L	L	L	M	M	3	2	F	---	2	CL,GC ML-CL	2	7	M	2	A	3
31-T25	M	L	L	L	M	H	3	2	F	6	2	GC,CL ML-CL	3	1,7	M	3	A	3
31-T26	M	L	M	L	M	H	3	2	G	6	2	ML, ML-CL	4	1,2,7	L	3	H	3
31-U21	M	L	L	L	L	M	4	2	G	---	2	ML,GM	2	1,7	M	2	A	3
31-U26	M	M	M	M	L	H	3	2	G	2	2	SM,GW	3&4	2,7	H	3	A	3
31-U30	M	M	M	M	L	H	3	3	G	2	3	SM,GW	5	1,6,7	H	3	A	3
32-K66	L	L	L	H	VH	M	2	3	F	2,6	1	SP, GP,SM	4	5	H	5	A	2
32-L66	L	L	L	L	L	M	4	2	G	3,5	1	SM,GW	3	5	M	5	A	2
32-L91	M	L	L	L	L	M	3	2	G	2	1	SM,GW	3	3,4,5	M	5	H	3
32-R66	M	L	L	M	H	M	3	3	G	1,4,6	1	SM	3	5	H	5	A	3

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LANDTYPE INTERPRETATIONS

WATERSHED

ENGINEERING

SILVICULTURE

LANDTYPE

	Mass Wasting Potential	Debris Avalanche Potential	Surface Erosion Potential	Subsoil Erosion Potential	Parent Material Erosion Potential	Slope Sediment Delivery Efficiency	Roading Suitability	Roading Construction Cost Class	Trafficability Class	Road Maintenance Factors	Rippability Class	Unified Soil Classification	Soil Productivity Class	Regeneration Limitations	Soil Sensitivity Class	Burning Class	Windthrow Class	Logging Method Class
32-S60	H	L	L	L	M	M	3	2	F	---	1	SM,ML	3	---	M	5	A	3
32-S95	H	L	L	L	M	M	3	2	G	1,3,4	2	SM,ML	3	3,4,5	M	5	H	3
32-U60	L	L	L	L	L	M	4	2	G	---	2	SM	3	---	M	5	A	3
32-U61	M	L	L	L	L	M	3	2	G	---	2	SM	4	5	M	5	A	3
32-U66	L	L	L	L	L	M	4	2	G	3	2	SM	3&4	5	M	5	A	3
32-U70	L	L	L	L	L	M	4	2	G	---	2	SM,GW	3&4	2,5,7	M	5	A	3
32-U80	L	L	H	L	L	M	4	2	G	---	2	SM,GW	4	1,2,7	H	4	A	3
32-U95	M	L	L	L	L	M	3	2	G	1,3,4	2	SM	3	3,4,5	M	5	H	3
33-K80	L	L	H	H	H	L	3	2	F	2,6	2	SM, SP,GP	4	1,2,7	H	4	A	1
33-U66	L	L	L	L	L	L	4	1	G	3,5	2	SM	3	5	M	5	A	1
33-U76	L	L	H	L	L	L	4	1	G	---	2	SM	5	5	H	4	A	1
33-U80	L	L	H	L	L	L	4	1	G	---	2	SM,GW	4	6	H	4	A	1
33-U86	L	L	H	L	L	L	4	1	G	---	2	GW,SM	5	1,6,7	H	4	A	1
33-U95	L	L	L	L	L	L	3	1	F	1,3,4	2	SM,GW	4	3,4,5	M	5	H	1
34-U66	L	L	L	M	L	M	4	2	G	3,5	2	SM,GW	3	5	M	5	A	3
34-U76	L	L	H	M	L	M	4	2	G	---	2	SM,GW	5	5,7	H	4	A	3
34-U80	L	L	H	M	L	M	4	2	G	---	2	SM,GW	4	6,7	H	4	A	3
34-U86	L	L	H	M	L	M	4	2	G	---	2	SM,GW	5	1,6,7	H	4	A	3
36-L66	M	L	L	M	L	M	3	2	G	3,5	1	SM,GW	3	5	M	5	A	2
36-U92	H	L	L	M	L	M	2	2	F	1,3,5	1	SM,GW	5	3,4,5	M	5	H	NA

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LANDTYPE INTERPRETATIONS

LANDTYPE	WATERSHED						ENGINEERING						SILVICULTURE					
	Mass Wasting Potential	Debris Avalanche Potential	Surface Erosion Potential	Subsoil Erosion Potential	Parent Material Erosion Potential	Slope Sediment Delivery Efficiency	Roading Suitability	Roading Construction Cost Class	Trafficability Class	Road Maintenance Factors	Rippability Class	Unified Soil Classification	Soil Productivity Class	Regeneration Limitations	Soil Sensitivity Class	Burning Class	Windthrow Class	Logging Method Class
38-L66	L	L	L	L	L	L	4	1	G	3,5	1	SM,GW	3	5	M	5	A	1
38-L91	L	L	L	L	L	L	3	1	G	1,3,5	1	SM,GW	3	3,4,5	M	5	H	1
38-L93	L	L	H	H	VH	L	2	2	F	1,3,5,6	1	SM,GW,ML	3	3,4,5	H	5	H	1
38-U80	L	L	H	L	L	L	3	1	G	---	2	SM,GW	3	---	H	4	A	1
41-L91	L	M	H	M	L	H	2	5	G	5	3	SM,GW,ML,OL	5	5	M	NA	NA	NA
42-L66	L	L	L	L	L	M	3	2	G	3,5	2	SM,GW	3	5,6	M	5	A	2
42-L91	M	L	L	L	L	M	3	2	G	1,3,5	2	SM,GW,ML,OL	3	3,4,5	M	5	H	2
47-L66	L	L	L	L	L	L	4	1	G	3,5	1	SM,GW	3	6	M	5	A	1
47-L91	L	L	L	L	L	L	3	1	G	3,5	1	SM,GW,ML,OL	4	3,4,5,6	H	5	H	1
48-L66	M	L	L	M	L	H	3	3	G	3,5	2	SM,GW	3	5,6	M	5	A	3
48-L80	M	M	H	M	L	H	2	3	G	5	3	GW	4	1,6,7	H	4	A	3
48-L91	H	L	L	M	L	H	2	4	G	1,3,5	2	SM,GW,ML	3	3,4,5,6	M	5	H	3
49-L66	H	L	L	M	L	VH	2	3	G	3,5	2	SM,GW	3	5,6,7	M	5	A	4
49-L80	M	M	H	M	L	VH	1	3	G	5	3	GW	4	1,6,7	H	4	A	4
49-L91	H	L	L	M	L	VH	2	4	G	1,3,5	2	SM,GW,ML	3	3,4,5,6	M	5	H	4
50	VH	M	L	M	M	H	1	3	P	1,3,4	3	All	2	3,4	M	1	H	All
60-G10	H	M	L	M	M	H	2	4	G	---	2	SM,GW	2	---	M	2	A	4
60-G20	H	M	L	M	M	H	2	4	G	2	2	SM,GW	3	7	M	3	A	4
60-K10	H	M	L	H	VH	H	1	5	F	2	2	SM,SP,GP	2	---	H	1	A	4
60-K20	H	M	L	H	VH	H	1	4	F	2	2	SM,SP,GP	3	7	H	2	A	4

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LANDTYPE INTERPRETATIONS

LANDTYPE	WATERSHED						ENGINEERING						SILVICULTURE					
	Mass Wasting Potential	Debris Avalanches Potential	Surface Erosion Potential	Subsoil Erosion Potential	Parent Material Erosion Potential	Slope Sediment Delivery Efficiency	Roading Suitability	Roading Construction Cost Class	Trafficability Class	Road Maintenance Factors	Rippability Class	Unified Soil Classification	Soil Productivity Class	Regeneration Limitations	Soil Sensitivity Class	Burning Class	Windthrow Class	Logging Method Class
60-Q10	M	M	L	M	L	H	3	4	G	---	2	SM,GW	2	---	M	1	A	3
60-Q20	M	M	L	M	L	H	3	4	G	---	3	SM,GW	3	7	M	2	A	3
60-S10	H	M	L	M	L	H	2	4	G	1,4	2	SM,ML	2	---	M	1	A	4
60-S20	H	M	L	M	L	H	2	4	G	1,4	2	SM,ML	3	7	M	2	A	4
60-S26	H	H	M	M	L	H	1	4	G	1,2,4	2	SM,ML,GW	3&4	2,6,7	H	3	A	4
60-U26	M	H	M	M	L	H	2	4	G	2	3	SM,GW	3&4	2,6,7	H	3	A	3
60-U60	M	M	L	M	L	H	3	4	G	---	2	SM,GW	3	---	M	5	A	3
60-U61	M	M	L	M	L	H	2	4	G	---	2	SM,GW	NA	3,5	M	5	A	3
60-U66	M	M	L	M	L	H	3	4	G	4	2	SM,GW	3&4	5	M	5	A	3
61-G10	H	M	L	M	M	VH	2	4	G	---	2	SM,GW	2	---	M	1	A	4
61-G20	H	M	L	M	M	VH	2	4	G	2	2	SM,GW	3	7	M	2	A	4
61-G44	VH	M	L	M	M	VH	1	5	F	1,3,4	2	SM,GW	3	3,4,5	M	1	H	4
61-K10	H	M	L	H	VH	VH	1	5	F	2	2	SM,SP,GP	2	---	H	1	A	4
61-K20	H	H	L	H	VH	VH	1	5	F	2	2	SM,SP,GP	3	7	H	2	A	4
61-K30	M	H	H	H	VH	VH	1	5	F	2	3	SM,SP,GP	3&4	2,6,7	H	3	A	4
61-Q10	H	M	L	M	L	VH	3	4	G	---	2	SM,GW	2	---	M	1	A	3
61-Q20	H	M	L	M	L	VH	3	4	G	2	3	SM,GW	3	7	M	2	A	4
61-R10	H	M	L	H	H	VH	1	4	F	1,4,6	2	SM,GW	2	---	H	1	A	4
61-R20	H	M	M	H	H	VH	1	4	F	1,2,4,6	2	SM,GW	3	7	H	2	A	4
61-S10	VH	M	L	M	M	VH	1	5	G	1,4	2	SM,ML	2	---	M	1	A	4

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LANDTYPE INTERPRETATIONS

LANDTYPE	WATERSHED						ENGINEERING						SILVICULTURE					
	Mass Wasting Potential	Debris Avalanche Potential	Surface Erosion Potential	Subsoil Erosion Potential	Parent Material Erosion Potential	Slope Sediment Delivery Efficiency	Roading Suitability	Roading Construction Cost Class	Trafficability Class	Road Maintenance Factors	Rippability Class	Unified Soil Classification	Soil Productivity Class	Regeneration Limitations	Soil Sensitivity Class	Burning Class	Windthrow Class	Logging Method Class
61-S20	VH	M	L	M	M	VH	1	5	G	1,4	2	SM,ML	3	7	M	2	A	4
61-S26	VH	H	M	M	M	VH	1	5	G	1,2	3	SM,ML	3&4	2,6,7	H	3	A	4
61-S44	VH	M	L	M	M	VH	1	5	F	1,3,4	2	SM,ML	3	---	M	5	A	4
61-S60	H	M	L	M	M	VH	2	4	G	1,4	2	SM,ML	3	3,4,5	M	5	A	4
61-T10	H	M	L	M	M	VH	3	4	G	1	2	SM,CL ML-CL	2	---	L	1	A	4
61-T20	H	M	L	M	M	VH	2	4	G	1	2	CL,GM ML-CL	2	7	M	2	A	4
61-U26	M	H	M	M	L	VH	1	5	G	2	3	SM,GW	3&4	2,6,7	M	3	A	4
61-U30	M	H	H	M	L	VH	1	5	G	2	3	SM,GW	5	1,2,6,7	H	3	A	4
61-U31	M	H	H	M	L	VH	2	5	G	2	3	GW	5	1,2,6,7	H	3	A	4
61-U60	M	M	L	M	L	VH	2	4	G	4	2	SM,GW	3	---	M	5	A	4
61-U61	H	M	L	M	L	VH	2	4	G	---	2	SM,GW	NA	3,5	M	5	A	3
61-U66	M	M	L	M	L	VH	3	4	G	3,4	2	SM,GW	3&4	5	M	5	A	4
61-U70	M	M	M	M	L	VH	3	4	G	---	2	SM,GW	4	2,6,7	M	4	A	4
61-U92	H	M	L	M	L	VH	1	5	F	1,3,4	2	SM,GW	3&4	3,4,5	M	5	H	4
61-U96	L	H	H	M	L	VH	1	4	G	2,5	2	SM,GW	NA	1,2,6	H	NA	A	4
63-G10	H	M	L	M	M	VH	2	4	G	---	2	SM,GW	2	---	M	1	A	4
63-G20	H	M	L	M	M	VH	1	4	G	2	2	SM,GW	3	7	M	2	A	4
63-G26	M	H	H	M	M	VH	1	4	G	2	2	SM,GW	3&4	1,2,6,7	H	3	A	4
63-G44	VH	M	L	M	M	VH	1	5	F	1,3,4	2	SM,GW	3	3,4,5	M	1	H	4
63-S10	VH	M	L	M	M	VH	1	5	G	1,4	2	SM,ML	2	---	M	1	A	4

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LANDTYPE INTERPRETATIONS

LANDTYPE	WATERSHED						ENGINEERING							SILVICULTURE					
	Mass Wasting Potential	Debris Avalanche Potential	Surface Erosion Potential	Subsoil Erosion Potential	Parent Material Erosion Potential	Slope Sediment Delivery Efficiency	Roading Suitability	Roading Construction Cost Class	Trafficability Class	Road Maintenance Factors	Rippability Class	Unified Soil Classification	Soil Productivity Class	Regeneration Limitations	Soil Sensitivity Class	Burning Class	Windthrow Class	Logging Method Class	
63-S26	VH	H	H	M	M	VH	1	5	G	1,4	2	SM,ML	3&4	1,2,6,7	H	3	A	4	
63-S44	VH	M	L	M	M	VH	1	5	F	1,3,4	2	SM,ML	3	3,4,5	M	5	H	4	
63-U80	L	H	H	M	L	VH	1	4	G	---	2	GW	5	1,6,7	H	4	A	4	
63-U92	H	M	L	M	L	VH	1	5	F	1,3,4	2	SM,GW	4	3,4,5	M	5	H	4	

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POTENTIAL WILDLIFE HABITAT INTERPRETATIONS

These landtype interpretations for potential wildlife habitat are designed to provide broad planning information about landform, soil and vegetative characteristics which are important elements of wildlife range. Such physical and biological characteristics are used to provide the user with an overall view of the relative potential of landtypes as wildlife habitat. These ratings may be used to stratify lands on a broad basis.

Factors such as past activity, animal behavioral patterns, and habitat quality on adjacent lands are not considered in this evaluation. These interpretations emphasize the potential climax vegetative patterns of land, rather than seral communities. It is recognized that certain techniques such as the burning of winter range may substantially improve forage availability on a particular landtype. Because these interpretations are quite broad, they should not be used as a substitute for field inventories or project work by District personnel.

Important elements of potential habitat which are considered in making the overall rating are (1) food, (2) cover, (3) water, and (4) vegetative diversity. These elements are rated as low, moderate, or high and summed up to provide the overall rating.

Although the emphasis for these ratings is for elk and deer habitat, generalizations for other species can be made as well. The elements considered in these interpretations are important to all forms of wildlife, although perhaps to different degrees.

Ratings are made for both summer and winter habitat. While the summer habitat rating uses the above basic elements, winter habitat also considers excessive snow depths which limit animal access and movement. The elevations and aspects which are limiting, and used in this rating are delineated in the Elk and Deer Winter Range Inventory and Management Techniques (Draft 1981, CNF). Elevations below 4,100 feet on warm aspect slopes, and 2,900 feet on cool aspect slopes are considered not limiting for animal access by snow depth in an average winter. The ratings on the following tables for winter range habitat on lower elevation landtype units apply only to areas where snow accumulations do not limit access. Higher elevations of a landtype which receive excessive snow would be rated low to reflect reduced access.

RATING SYSTEM ELEMENTS

1. Food

High - Food sources include an abundant variety and production of shrubs, grasses and forbs for use in browsing or grazing. Vegetation typically includes climax conifer stands with alder, ferns, and sedges either in concentrated areas or dispersed through the area. Soils are productive and are varied, typically having both well and poorly drained components with diverse characteristics.

Moderate - Vegetation lacks either variety or productivity of shrubs, grasses, and forbs. Typically these are climax conifer stands with little understory variety. Soils are dominantly well drained with moderate to high productivity and moderate variation of characteristics.

Low - These sites lack variety and productivity of shrubs, forbs, and grasses. Soils are often shallow, droughty, and have rock outcrops. For winter range, all high elevation units (above 4,800 feet) are rated low due to unavailability of food for animals on these sites because of snow depths and inaccessibility.

2. Cover

High - These include diverse vegetative types which provide hiding and thermal cover. Sites typically have overstory climax conifer stands with alder and fern filled draws. Soils are productive and varied, having both well and poorly drained types with diverse characteristics.

Moderate - These sites include vegetative types which have hiding or thermal cover. Sites typically contain a uniform climax conifer overstory with little diversity. Soils are dominantly well drained with moderate to high productivity, and moderate variation of characteristics.

Low - These sites lack diversity of vegetation which affords very limited hiding or thermal cover. Vegetation is typically sparse with scattered overstory. Steep warm aspect slopes on summer range are rated low due to high insolation rates. Soils are often droughty, shallow, and have low productivity. High elevation units (above 4,800 feet) are rated low for winter habitat due to inaccessibility of cover on these sites because of snow depths.

3. Water

High - These sites have landtype characteristics with abundant water sources. Such areas include riparian zones, low order streams, wet meadows, draws, seeps, and springs. Soils are productive and varied.

Moderate - These sites normally have water sources available or nearby, usually as low order or intermittent streams. These areas generally lack riparian zones, seeps and wet draws. Soils are moderate to highly productive and moderately varied.

Low - These sites normally lack available water sources. Such units are often droughty, rocky sites with few surface flows. High elevation (above 4,800 feet) units are rated low due to the unavailability of water for animals on these sites due to snow depth. Soils are generally low in productivity.

4. Vegetative Diversity

High - These sites have contrasting patterns of vegetation and soil which are present and distinct. Typical situations would include climax conifer stands adjacent to alder or fern filled draws, and where understory broadleaf shrubs occupy at least one third of the unit and are evenly distributed throughout the climax timber. Soils are highly productive, include both well and poorly drained areas, and are highly varied.

Moderate - These sites have limited contrasting patterns of vegetation and soil. Typically these are climax conifer stands with little diversity. Soils are moderate to highly productive with moderate variation.

Low - These sites lack contrasting patterns of vegetation and soil. Typically these units range from climax stands with insignificant diversity to barren, droughty slopes. Soils are generally low in productivity and have very limited variety. High elevation units (above 4,800 feet) are rated low for winter habitat due to inaccessibility of these sites.

LANDTYPE	SUMMER OR WINTER RANGE	FOOD	WATER	COVER	DIVERSITY	OVERALL POTENTIAL HABITAT RATING
10-A40	S	H	H	H	H	H
	W	H	H	H	H	H
10-A90	S	H	H	H	H	H
	W	L	L	L	L	L
11-A40	S	H	H	H	H	H
	W	H	H	H	H	H
11-A47	S	M	M	M	M	M
	W	M	M	M	M	M
11-A97	S	H	H	H	H	H
	W	L	L	L	L	L
13-A00	S	M	M	M	M	M
	W	M	M	M	M	M
15-U00	S	M	M	M	M	M
	W	M	M	M	M	M
16-U96	S	H	H	M	H	H
	W	L	L	L	L	L
22-A00	S	M	M	H	L	M
	W	M	M	H	L	M
22-A01	S	M	M	H	L	M
	W	M	M	H	L	M
22-A02	S	M	M	H	L	M
	W	M	M	H	L	M

LANDTYPE	SUMMER OR WINTER RANGE	FOOD	WATER	COVER	DIVERSITY	OVERALL POTENTIAL HABITAT RATING
22-A03	S	M	M	H	L	M
	W	M	M	H	L	M
22-A06	S	M	M	H	L	M
	W	M	M	H	L	M
22-A07	S	M	M	H	L	M
	W	M	M	H	L	M
22-G00	S	M	M	H	L	M
	W	M	M	H	L	M
22-G01	S	M	M	H	L	M
	W	M	M	H	L	M
22-G45	S	H	H	H	H	H
	W	L	L	L	L	L
22-G95	S	H	H	H	H	H
	W	L	L	L	L	L
22-K00	S	M	M	H	L	M
	W	M	M	H	L	M
22-K45	S	H	H	H	H	H
	W	H	H	H	H	H
22-Q00	S	M	M	H	L	M
	W	M	M	H	L	M
22-Q01	S	M	M	H	L	M
	W	M	M	H	L	M
22-S00	S	M	M	H	L	M
	W	M	M	H	L	M
22-S01	S	M	M	H	L	M
	W	M	M	H	L	M
22-S45	S	H	H	H	H	H
	W	L	L	L	L	L
22-T01	S	M	M	H	L	M
	W	M	M	H	L	M
22-U25	S	M	M	H	L	M
	W	M	M	H	L	M
23-G20	S	M	M	H	L	M
	W	M	M	H	L	M

LANDTYPE	SUMMER OR WINTER RANGE	FOOD	WATER	COVER	DIVERSITY	OVERALL POTENTIAL HABITAT RATING
23-K20	S	M	M	H	L	M
	W	M	M	H	L	M
23-S20	S	M	M	H	L	M
	W	M	M	H	L	M
24-A01	S	M	M	H	L	M
	W	M	M	H	L	M
24-G10	S	M	M	H	L	M
	W	M	M	H	L	M
24-G20	S	M	M	H	L	M
	W	L	L	L	L	L
24-G21	S	M	M	H	L	M
	W	M	M	H	L	M
24-G45	S	H	H	H	H	H
	W	H	H	H	H	H
24-G95	S	H	H	H	H	H
	W	L	L	L	L	L
24-K10	S	M	M	H	L	M
	W	L	L	L	L	L
24-K20	S	M	M	H	L	M
	W	M	M	H	L	M
24-K45	S	H	H	H	H	H
	W	L	L	L	L	L
24-Q10	S	M	M	H	L	M
	W	M	M	H	L	M
24-Q20	S	M	M	H	L	M
	W	M	M	H	L	M
24-Q25	S	M	M	H	L	M
	W	M	M	H	L	M
24-Q45	S	H	H	H	H	H
	W	H	H	H	H	H
24-R00	S	M	M	H	L	M
	W	M	M	H	L	M

LANDTYPE	SUMMER OR WINTER RANGE	FOOD	WATER	COVER	DIVERSITY	OVERALL POTENTIAL HABITAT RATING
24-R45	S	H	H	H	H	H
	W	H	H	H	H	H
24-S10	S	M	M	H	L	M
	W	M	M	H	L	M
24-S20	S	M	M	H	L	M
	W	M	M	H	L	M
24-S25	S	M	M	H	L	M
	W	M	M	H	L	M
24-S45	S	H	H	H	H	H
	W	H	H	H	H	H
24-S95	S	H	H	H	H	H
	W	L	L	L	L	L
24-T01	S	M	M	H	L	M
	W	M	M	H	L	M
24-T11	S	M	M	H	L	M
	W	M	M	H	L	M
24-T21	S	M	M	H	L	M
	W	M	M	H	L	M
24-T25	S	M	M	H	L	M
	W	M	M	H	L	M
24-U26	S	M	L	M	M	M
	W	M	L	M	M	M
31-G10	S	M	M	H	L	M
	W	M	M	H	L	M
31-G20	S	M	M	H	L	M
	W	M	M	H	L	M
31-G45	S	H	H	H	H	H
	W	L	L	L	L	L
31-G95	S	H	H	H	H	H
	W	L	L	L	L	L
31-K10	S	M	M	H	L	M
	W	M	M	H	L	M
31-K20	S	M	M	H	L	M
	W	M	M	H	L	M

LANDTYPE	SUMMER OR WINTER RANGE	FOOD	WATER	COVER	DIVERSITY	OVERALL POTENTIAL HABITAT RATING
31-K26	S	M	L	M	M	M
	W	M	L	M	M	M
31-Q10	S	M	M	H	L	M
	W	M	M	H	L	M
31-Q20	S	M	M	H	L	M
	W	M	M	H	L	M
31-Q25	S	M	M	H	L	M
	W	M	M	H	L	M
31-R10	S	M	M	H	L	M
	W	M	M	H	L	M
31-R20	S	M	M	H	L	M
	W	M	M	H	L	M
31-S10	S	M	M	H	L	M
	W	M	M	H	L	M
31-S20	S	M	M	H	L	M
	W	M	M	H	L	M
31-S21	S	M	M	H	L	M
	W	L	L	L	L	L
31-S25	S	M	M	H	L	M
	W	M	M	H	L	M
31-S45	S	H	H	H	H	H
	W	H	H	H	H	H
31-T10	S	M	M	H	L	M
	W	M	M	H	L	M
31-T20	S	M	M	H	L	M
	W	M	M	H	L	M
31-T25	S	M	M	H	L	M
	W	M	M	H	L	M
31-T26	S	M	L	M	M	M
	W	M	L	M	M	M
31-U21	S	M	M	H	L	M
	W	L	L	L	L	L
31-U26	S	M	L	M	M	M
	W	M	L	M	M	M

LANDTYPE	SUMMER OR WINTER RANGE	FOOD	WATER	COVER	DIVERSITY	OVERALL POTENTIAL HABITAT RATING
31-U30	S	L	L	L	M	L
	W	L	L	L	L	L
32-K66	S	M	M	H	L	M
	W	L	L	L	L	L
32-L66	S	M	M	H	L	M
	W	L	L	L	L	L
32-L91	S	H	H	H	H	H
	W	L	L	L	L	L
32-R66	S	M	M	H	L	M
	W	L	L	L	L	L
32-S60	S	M	M	H	L	M
	W	L	L	L	L	L
32-S66	S	M	M	H	L	M
	W	L	L	L	L	L
32-S70	S	M	M	H	L	M
	W	L	L	L	L	L
32-S95	S	H	H	H	H	H
	W	L	L	L	L	L
32-U60	S	M	M	H	L	M
	W	L	L	L	L	L
32-U61	S	H	M	M	H	H
	W	L	L	L	L	L
32-U66	S	M	M	H	L	M
	W	L	L	L	L	L
32-U70	S	M	M	H	L	M
	W	L	L	L	L	L
32-U80	S	M	L	M	M	M
	W	L	L	L	L	L
32-U95	S	H	H	H	H	H
	W	L	L	L	L	L
33-K80	S	M	L	M	M	M
	W	L	L	L	L	L
33-L66	S	M	M	H	L	M
	W	L	L	L	L	L

LANDTYPE	SUMMER OR WINTER RANGE	FOOD	WATER	COVER	DIVERSITY	OVERALL POTENTIAL HABITAT RATING
33-U66	S	M	M	H	L	M
	W	L	L	L	L	L
33-U76	S	H	L	L	M	M
	W	L	L	L	L	L
33-U80	S	M	L	M	M	M
	W	L	L	L	L	L
33-U86	S	M	L	M	M	M
	W	L	L	L	L	L
33-U95	S	H	H	H	H	H
	W	L	L	L	L	L
34-L66	S	M	M	H	L	M
	W	L	L	L	L	L
34-U66	S	M	M	H	L	M
	W	L	L	L	L	L
34-U76	S	H	L	L	M	M
	W	L	L	L	L	L
34-U80	S	M	L	M	M	M
	W	L	L	L	L	L
34-U86	S	M	L	M	M	M
	W	L	L	L	L	L
36-L66	S	M	M	H	L	M
	W	L	L	L	L	L
36-U92	S	H	H	H	H	H
	W	L	L	L	L	L
38-L66	S	M	M	H	L	M
	W	L	L	L	L	L
38-L91	S	H	H	H	H	H
	W	L	L	L	L	L
38-L93	S	H	H	H	H	H
	W	L	L	L	L	L
38-U80	S	M	L	M	M	M
	W	L	L	L	L	L

LANDTYPE	SUMMER OR WINTER RANGE	FOOD	WATER	COVER	DIVERSITY	OVERALL POTENTIAL HABITAT RATING
38-U95	S	H	H	H	H	H
	W	L	L	L	L	L
41-L91	S	H	H	M	H	H
	W	L	L	L	L	L
42-L66	S	M	M	H	L	M
	W	L	L	L	L	L
42-L91	S	H	H	M	H	H
	W	L	L	L	L	L
47-L66	S	M	M	H	L	M
	W	L	L	L	L	L
47-L91	S	H	H	M	H	H
	W	L	L	L	L	L
48-L66	S	M	M	H	L	M
	W	L	L	L	L	L
48-L80	S	M	L	M	M	M
	W	L	L	L	L	L
48-L91	S	H	H	M	H	H
	W	L	L	L	L	L
49-L66	S	M	M	H	L	M
	W	L	L	L	L	L
49-L80	S	M	L	M	M	M
	W	L	L	L	L	L
49-L91	S	H	H	M	H	H
	W	L	L	L	L	L
50	S	M	M	H	M	M
	W	M	M	H	M	M
60-G10	S	M	M	H	L	M
	W	M	M	H	L	M
60-G20	S	M	M	L	L	L
	W	M	M	H	L	M
60-K10	S	M	M	H	L	M
	W	M	M	H	L	M
60-K20	S	M	M	L	L	L
	W	M	M	H	L	M

LANDTYPE	SUMMER OR WINTER RANGE	FOOD	WATER	COVER	DIVERSITY	OVERALL POTENTIAL HABITAT RATING
60-Q10	S	M	M	H	L	M
	W	L	L	L	L	L
60-Q20	S	M	M	L	L	I
	W	M	M	H	L	M
60-S10	S	M	M	H	L	M
	W	M	M	H	L	M
60-S20	S	M	M	L	L	L
	W	M	M	H	L	M
60-S26	S	M	L	L	M	L
	W	M	L	M	M	M
60-U26	S	M	L	L	M	L
	W	M	L	M	M	M
60-U60	S	M	M	H	L	M
	W	L	L	L	L	L
60-U61	S	H	M	M	H	H
	W	L	L	L	L	L
60-U66	S	M	M	H	L	M
	W	L	L	L	L	L
61-G10	S	M	M	H	L	M
	W	M	M	H	L	M
61-G20	S	M	M	L	L	L
	W	M	M	H	L	M
61-G44	S	H	H	H	H	H
	W	L	L	L	L	L
61-K10	S	M	M	H	L	M
	W	M	M	H	L	M
61-K20	S	M	M	L	L	L
	W	M	M	H	L	M
61-K30	S	M	L	L	M	L
	W	M	L	M	M	M
61-Q10	S	M	M	H	L	M
	W	M	M	H	L	M
61-Q20	S	M	M	L	L	L
	W	M	M	H	L	M

LANDTYPE	SUMMER OR WINTER RANGE	FOOD	WATER	COVER	DIVERSITY	OVERALL POTENTIAL HABITAT RATING
61-R10	S	M	M	H	L	M
	W	M	M	H	L	M
61-R20	S	M	M	L	L	L
	W	M	M	H	L	M
61-S10	S	M	M	H	L	M
	W	M	M	H	L	M
61-S20	S	M	M	L	L	L
	W	M	M	H	L	M
61-S26	S	M	L	L	M	L
	W	M	L	M	M	M
61-S44	S	H	H	H	H	H
	W	H	H	H	H	H
61-S60	S	M	M	H	L	M
	W	L	L	L	L	L
61-T10	S	M	M	H	L	M
	W					
61-T20	S	M	M	L	M	L
	W	M	M	M	M	M
61-U26	S	M	L	L	M	L
	W	M	L	M	M	M
61-U30	S	M	L	L	M	L
	W	M	L	M	M	M
61-U31	S	L	L	L	L	L
	W	L	L	L	L	L
61-U60	S	M	M	H	L	M
	W	L	L	L	L	L
61-U61	S	H	M	M	H	H
	W	L	L	L	L	L
61-U66	S	M	M	H	L	M
	W	L	L	L	L	L
61-U70	S	M	M	L	L	L
	W	L	L	L	L	L

LANDTYPE	SUMMER OR WINTER RANGE	FOOD	WATER	COVER	DIVERSITY	OVERALL POTENTIAL HABITAT RATING
61-U86	S	L	L	M	L	L
	W	L	L	L	L	L
61-U92	S	H	H	H	H	H
	W	L	L	L	L	L
61-U96	S	H	H	M	H	H
	W	L	L	L	L	L
63-G10	S	M	M	H	L	M
	W	M	M	H	L	M
63-G20	S	M	M	L	L	L
	W	M	M	H	L	M
63-G26	S	M	L	L	M	L
	W	M	L	M	M	M
63-G44	S	H	H	H	H	H
	W	L	L	L	L	L
63-Q10	S	M	M	H	L	M
	W	L	L	L	L	L
63-S10	S	M	M	H	L	M
	W	M	M	H	L	M
63-S26	S	M	L	L	M	L
	W	M	L	M	M	M
63-S44	S	H	H	H	H	H
	W	H	H	H	H	H
63-U80	S	M	L	L	M	L
	W	L	L	L	L	L
63-U92	S	H	H	H	H	H
	W	L	L	L	L	L



GLOSSARY

- Adverse structure--Bedrock jointing and fracture planes parallel to the slope.
- Aeolian (eolian)--Wind deposited.
- Alfisol--One of 10 orders according to soil taxonomic system (U.S.D.A. 1975 Soil taxonomy). This group characteristically has relatively high base saturation level (greater than 35%) and has significantly more clay in the B horizon (subsoil) than in the A horizon (surface soil). Has argillic horizon.
- A Horizon--Mineral soil horizon, usually at soil surface; has an organic matter accumulation, has lost clays, iron, aluminum through leaching.
- Anorthosite--A granular igneous rock composed mainly of feldspar.
- Alluvial--Deposited by running water.
- Alluvium--Soil material deposited by running water.
- Argillic horizon--This is a B horizon (subsoil) which has at least 20% more clay in it than the horizon above. This clay accumulation is the result of illuviation, or the movement from an overlying horizon into the B horizon.
- Argillite--Fine grained sedimentary rocks having high silt and clay proportions.
- Basalt--A dark, fine grained igneous rock derived in central Idaho from the Columbia river lava flows, relatively hard rock useful for road surfacing purposes.
- Base Saturation--The extent to which soil exchange sites are filled with cations, usually includes Ca and Mg as principal bases. This property generally is influenced by soil ph.
- B Horizon--Subsoil horizon, usually found below A horizon in profile; has an illuvial concentration of clay, iron, aluminum, an altered horizon.
- Breaklands--Landforms standing at or above the angle of repose, generally having slopes of 60% or greater.
- Breccias--Rocks having sharp fragments embedded in a fine grain matrix.
- C Horizon--Weakly modified layer usually beneath B horizon in profile; may be like or unlike material from which soil formed.
- Cirque--The basin occurring at the head of a glaciated valley.
- Clay--A size class of soil particles, including all particulate matter smaller than 0.002 mm (0.0008 in.) diameter.
- Clay loam--Soil texture dominated by clay and silt sized particles--See soil texture (diagram).
- Coarse fragments--Any rock fragment over 2 mm (0.08 in.) in diameter.
- Coarse textures--Soil textures including sands, loamy sands, and sandy loams.
- Cobble--Rock fragments ranging from 7.6 to 25.4 cm (3-10 in.) in diameter.
- Colluvial (colluvium)--A general term applied to any loose heterogeneous and incoherent mass of soil material or rock fragments deposited chiefly by gravity at the base of a steep slope.
- Colluvium--Rock fragments and soil material accumulated at the base of steep slopes as a result of gravitational action.
- Cool Aspects--Northerly facing sites; for purposes of this report positions facing between 270° northerly to 90°.
- Cryic--Soil temperature regime where mean annual soil temperature is less than 47°F (8°C) and the difference between mean winter and summer temperatures is less than 9°F (5°C). Most forest soils above approximately 4800' fall into this category on the Clearwater Forest.

Cryoplanation (cryoplaned)--The reduction and modification of a land surface by processes associated with intensive frost action, such as solifluction, supplemented by the erosive and transport actions of running water, moving ice, and other agents.

Deep--Soil depths greater than 48" to competent bedrock or firm, restricting layers.

Dendritic--A drainage pattern in which the streams branch irregularly in all direction and at almost any angle.

Dissection relief--The depth to which a dissecting force has incised into a land form, expressed in distance.

Drainage--degree and rate of water removal from soil profile, see well, poor, excessively drained.

Excessively drained--Soil drainage class where water is removed from the soil very rapidly. Such soils are often coarse textured.

External relief--The overall elevational change from the lower margin of a landtype to the upper margin.

Fluvial--Produced by the action of running water.

Fine textures--Soil textures including clays, silty clay loams, and clay loams.

Fragipan--Naturally dense, brittle subsoil layers which can cause perching of water and poor drainage.

Frigid--Soil temperature regime where mean annual soil temperature is less than 47°F (8°C) and the difference between mean winter and summer temperatures is more than 9°F (5°C). Most forest soils below approximately 4800' fall into this category on the Clearwater Forest.

Gneiss--A foliated metamorphic rock showing color banding, associated with the border zone rocks in north central Idaho.

Glacial till--Unsorted and unstratified drift, generally unconsolidated, deposited directly by and underneath a glacier without subsequent reworking by water from the glacier and consisting of a heterogenous mixture of clay, sand, gravel, and boulders, varying widely in size and shape.

Glaciofluvial--Pertaining to the deposits and landforms produced by melt-water streams flowing from wasting glaciers.

Glacial headland--The upper slopes of, and immediately above, glacial valleys and cirque basins.

Granite--A coarse grained, acidic igneous rock common in central Idaho as a major component of the Idaho Batholith.

Granodiorite--A quartzose intrusive igneous rock with properties intermediate between granite and quartz diorite.

Gravel--Rock fragments between 2 and 76 mm (.08 to 3 in.) diameter.

Grus--Angular coarse--grained fragments resulting from the granular disintegration of crystalline rocks.

High Elevation--Above 4800 feet for purposes of this report. Subalpine fir is generally the dominant conifer type.

Horn--A high, rocky, sharp-pointed, steep-sided, pyramidal mountain peak with prominent faces and ridges, bounded by the intersection walls of three or more cirques.

Illuviation--The movement of material into a portion of the soil profile, usually from an upper to a lower horizon.

Interfluve--Area between rivers or streams.

Interglacials--Time intervals between two successive glacial epochs or stages.

Internal relief--Extremes of relief within a unit of interest (i.e., a landtype).

Intrusion--Mass of rock which is squeezed into the surrounding rock formations.

Lacustrine--Material deposited in lakes.

Landform--Any physical, recognizable feature of the earth's surface having a characteristic shape and produced by natural causes.

Landtype--A unit of land with similar soil, hydrologic and vegetative characteristics.

Loam--Soil textures having appreciable amounts of sand and silt size particle sizes often with significant clay--see soil texture (diagram).

Loamy sand--Soil texture dominated by sand sized particles--see soil texture (diagram).

Loess--Homogenous, unstratified silts which are primarily wind deposited (eolian).

Low Elevation--Below 4800 feet for purposes of this report. Western red cedar, grand fir, and Douglas fir are generally the dominant timber types.

Mass wasting--A general term for dislodgement and downslope transport of soil and rock material under the direct application of gravitational body stress.

Medial--Refers to volcanic ash rich soil material; a part size class modifier, i.e. medial-skeletal.

Medium--Volcanic ash; topsoil depth ranging from 7 to 14 inches thick. Other classes--thin--less than 7 inches, thick--greater than 14 inches.

Medium texture--Soil textures including silt loam and loams.

Metamorphism--The mineral and structural adjustment of solid rocks to physical and chemical conditions imposed at depth below surface zones of weathering and cementation, and differing from conditions under which the rocks in question originated.

Migmatite--Rock consisting of igneous and metamorphic components.

Mottles--Spotting or alteration of soil color due to the reduction in iron when soils are saturated for periods of time. Soil mineral grains usually appear gray or blue-gray in color, indicative of poorly drained conditions.

Neve--Area covered with perennial snow, or the accumulation area above or at the head of a glacier.

Nivation--Erosion of rock or soil beneath a snowbank or snow patch and around its fluctuating margin, caused mainly by frost action but also involving solifluction, chemical weathering and meltwater transport of weathering products.

Non-skeletal--Soils having less than 35% rock fragments (those greater than 2mm diameter) in parts of soil profile.

Old surface--A general term used on the Clearwater National Forest that refers to the gentle, rolling, upland surface that existed before downcutting of major drainages. Many remnants of the old surface still exist and are referred to as such.

Parent Material--Mineral material from which soil is formed originally; for purposes of this report parent material is weakly altered material usually deep in profile which has characteristics of the assumed original bedrock. Part of profile below subsoil.

Patterned ground--A term used to describe certain more or less symmetrical forms such as circles, polygons, nets, steps and stripes that are characteristic of, but not necessarily confined to, surficial materials subject to intense frost action.

Pegmatite--An extremely coarse grained igneous rock.

Penplain--A low, nearly featureless, and gently undulating or almost plain land surface of considerable area which presumably has been reduced by the processes of long continued sub-aerial erosion.

Periglacial--Processes, conditions, areas, climates and topographic features at the immediate margins of former and existing glaciers and ice sheets, and influenced by the cold temperatures of the ice.

Plasticity--The ability to change shape continuously under the influence of applied stress and retain the impressed shape upon removal of the stress.

Plutonic--Pertaining to igneous rocks formed at great depth. Rocks of this type are formed by crystalization of magma and tend to be coarse-grained.

Poorly drained--Soil drainage class where water is removed so slowly that soil remains wet for lengthy periods of time.

Quartzite--Relatively hard rocks derived from metamorphosed sandstone.

Quartz Diorite--Intermediate igneous rocks, similar to granite.

Quartz Monzonite--Intermediate igneous rocks, similar to granite.

Regolith--A general term for the entire mantle of fragmental, loose, incoherent or unconsolidated material of whatever origin that forms the surface of the land and overlies or covers coherent bedrock.

Rejuvenation--The action resulting in renewal of stream erosive activity (uplift or drop in sea level).

Rhyolite--Fine grained intrusive rocks having composition equivalent to granite.

Sand--A size class of soil particles ranging from 2 mm to 0.05 mm (0.08 to 0.02 in.) diameter.

Sandy--Generally refers to coarse textured soils, includes the following classes; sands, loamy sands.

Sandy loam--Soil texture dominated by sand and silt size particles--see soil texture (diagram)

Schist--Coarse grained, laminated metamorphic rocks, generally with high mica content.

Shallow--Soil depths less than 20 inches to bedrock or highly restricting layer.

Silt--A size class of soil particles ranging from 0.05 to 0.002 mm (0.02 to .0008 in.) diameter.

Silt loam--Soil texture dominated by silt sized particles--see soil texture (diagram).

Silty clay loam--Soil texture dominated by silt and clay sized particles - see soil texture (diagram)

Siltite--Sedimentary rocks composed of lithified silts.

Skeletal--Soils having more than 35% rock fragments which are greater than 2mm diameter in parts of the soil profile. Term is used with prefix sandy, loamy or clayey to describe particle size classes. (i.e. loamy-skeletal).

Slope hydrology--The manner by which a slope disposes of the water it receives.

Soil Complex--Where two or more taxonomic units occur so intermixed geographically that it is impractical to separate them.

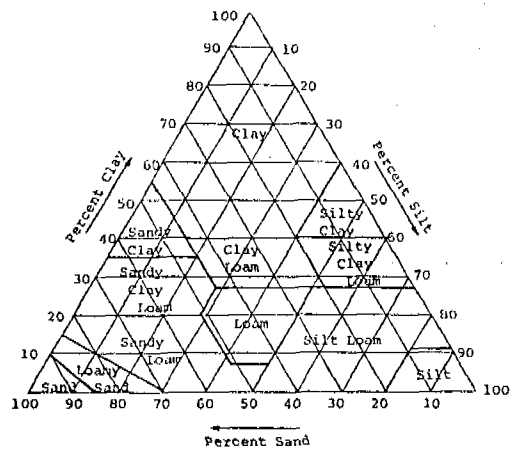
Soil Organic Matter--Organic fraction of the soil includes plant and animal residues at various stages of decomposition.

Soil Horizon--A layer of soil material approximately parallel to the land surface, and differing from adjacent layers.

Soil profile--Vertical section of soil through all horizons, into parent material.

Soil Structure--The combination of primary soil particles into secondary units or peds.

Soil Texture--The relative proportion of sand, silt and clay in the soil. See diagram on next page.



Triangle for determining soil textural class (Soil Survey Manual, p. 209).

Solifluction--The slow (normally 0.5-5.0 cm/year), viscous downslope flow of waterlogged soil and other unsorted surface material. This is often associated with materials underlain by frozen ground (not necessarily permafrost).

Stones--Rock fragments greater than 10 inches in diameter.

Stone garlands--A sorted step consisting of a tongue-shaped mass of fine material enclosed on the downslope side by a crescentic stony embankment.

Stone nets--A form of patterned ground whose mesh is dominantly polygonal and has a sorted appearance commonly due to a border of stones surrounding finer material.

Stone stripes--Alternating bands of finer and coarser material comprising a form of patterned ground.

Structure--Aggregation of individual soil particles into compound particles. Types of structure include prismatic, columnar, angular blocky, subangular blocky, platy and granular.

Stickiness--The degree to which wet soil adheres to other objects. This property is usually related to the amount and type of clay in the soil.

Subsoil--Mineral soil material which has been altered by weathering, soil forming processes; has accumulation of iron, clay, aluminum, humus. Part of profile below surface soil, and overlying parent material.

Surface creep--The gradual downslope movement of surface soil and rock material due to gravity. Freeze-thaw processes and water may be contributing factors.

Surface Soil--Mineral soil surface horizon characterized by organic matter accumulation; normally darker in color than underlying horizons, overlies subsoil.

Talus--Fragments of rock and other soil material accumulated by gravity at the foot of cliffs or steep slopes.

Tectonic--Pertaining to the forces involved in, or the structures or features resulting from, the earth's crustal movements.

Terrace--Along, narrow, relatively level or gently inclined surface bounded along one edge by a steeper descending slope and along the other by a steeper ascending slope; a bench.

Thick--Volcanic ash topsoil 14 inches or greater in thickness.

Thin--Volcanic ash topsoil less than 7 inches in thickness.

Till--Unstratified glacial drift deposited directly by ice and consisting of clay, sand, gravel and rock fragments mixed in a homogenous manner.

Toe slope--The lower, gentle slope of a hillside, occurring at the foot of a steep hillside and usually exhibiting accumulations of unconsolidated material.

Trellis drainage pattern--Characterized by parallel main streams intersected at or near right angles by their tributaries, which in turn are fed by elongated secondary tributaries parallel to the main streams. This pattern is often indicative of marked structural control of the drainage pattern.

Trough--The U shaped valley formed by glacial ice, has associated concave trough walls.

Tuffs--Volcanic ash and dust.

Umbric Horizon--Surface layer of soil characterized by dark color and low base saturation (less than 50%). Generally forms under grass or broad leaf vegetation.

Valley train--A long, narrow body of outwash deposited by meltwater streams beyond the terminal moraine or margin of an active glacier, and confined within the walls of a valley below the glacier.

Volcanic Ash--Airborne products of volcanic activity deposited over much of forested region of North Idaho and Western Mountain.

Warm Aspects--Southerly facing sites; for purposes of this report positions facing between 90° southerly to 270°.

Well drained--Soil drainage class where water is removed readily from the soil but not rapidly.

