

April 24, 1997

Tom:

Listd below are the 19 landtypes which were mapped at the Priest River Experimental Forest. Following this list are the map unit descriptions for each of them.

109
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It is important to realize that these descriptions were prepared for these landtypes as they occur across the IPNF and not just the PREF. For this reason the landtypes have a greater range of characteristics than occur at PREF.

After you have a chance to look them over, give me a call if you have questions.

Thanks!

Gary

Map Unit 109 Aquepts-Saprists-Aquents-Aquolls complex

MAP UNIT SUMMARY

This map unit consists of low to high elevation, poorly drained floodplains, bogs and wet meadows underlain by granitic or metasedimentary rocks. Soils form in volcanic ash influenced loess overlying alluvium, outwash or till. Vegetation is a variety of wetland species. Delineations are mainly in the glaciated portions of the Purcell, Cabinet and Selkirk Mountains.

MAP UNIT PROPERTIES

LANDFORM: This map unit occurs on poorly drained floodplains and wet mountain meadows at elevations of 1840 to 5400 feet. Dominant slopes have gradients of 0 to 5 percent. This unit contains poorly drained, alluvial lands associated with very low gradient streams, marshes, ponds and bogs. It also includes wet mountain meadows. Glaciation leaves many wetland areas in the basins and depressions which it creates on the landscape.

GEOLOGY: Substratum materials are alluvium, outwash and till from a variety of bedrock sources.

VEGETATION: Undisturbed vegetation includes sedges, rushes, moist site grasses and forbs, and various kinds of floating plants. Some areas of mixed coniferous and deciduous forest occur surrounding these wet areas.

SOILS

Distribution: This unit contains very poorly or poorly drained soils that formed in alluvial deposits in drainageways, on floodplains and in bottoms. They contain high water tables most of the year.

The major soil has formed in alluvium derived dominantly from volcanic ash and is a medial, nonacid frigid Mollic Andaquepts. The surface layer is silt loam. Below this to a depth of 60 inches or more is stratified very fine sandy loam to silty clay loam that commonly is very gravelly or cobbly in the lower part.

The other major soil in this unit formed in organic material derived dominantly from herbaceous plants. The soils are organic material throughout and are Euc Typic Borosaprists.

MAP UNIT MANAGEMENT INTERPRETATIONS

WATERSHED: These areas have high water tables and nearby stream channels. The major watershed management concern is protection of water quality in the stream and other riparian dependent resources. Stream channels and banks should be protected. Bridges and culverts should be carefully planned to maintain channel stability. Practices which disturb soils on or adjacent to streambanks can increase stream sediment. The streams that flow through this unit flood occasionally.

ROADS: This unit contains bogs, swamps and wet meadows which are difficult areas for road construction. High water tables severely limit excavation and make equipment use difficult. Flooding may erode fills and damage bridges and culverts.

Low lying areas are subject to occasional flooding. The best road locations are out of the riparian zone above the zone of flooding and high water table. Stream crossings must be accomplished with care or sediment from the road can find its way into the stream.

TIMBER: This unit contains only scattered stands of trees and is poorly suited for timber management. The high water table severely limits tree growth and equipment use.

Burning when surface layers are dry can cause soil damage and may reduce long-term productivity. Hot burns can create water repellent surface soils with reduced infiltration rates, greater overland flow and higher erosion potentials. Burning when the surface soil is moist prevents these impacts and helps maintain long-term productivity.

Map Unit 119 Typic Udivitrands, lacustrine substratum, draws

MAP UNIT SUMMARY

This map unit consists of dissected glacial lacustrine plains. Streams have downcut into the lacustrine plain creating shallowly incised draws. Soils form in volcanic ash influenced loess overlying mostly silty lacustrine sediments. Vegetation is mixed coniferous forest. Most delineations occur between the Pend Oreille River and Priest Lake with a smaller amount found in the Purcell Trench around Bonners Ferry.

MAP UNIT PROPERTIES

LANDFORM: This map unit occurs as shallowly incised draws in wide, valley bottoms at elevations of 1760 to 2500 feet. It consists of the streams and associated V-shaped draws. Dominant slope gradients in the bottoms are 0 to 5 percent.

GEOLOGY: Substratum materials are thick, lacustrine sediments from an unnamed glacial lake. This lake was caused by an arm of the continental ice sheet. The ice moved down the Purcell Trench and one lobe moved to the west down the Pend Oreille River valley. The ice dammed the Priest River and formed a large lake.

The sediments found in this lake contain little gravel or cobble and have a fine-silty and coarse-silty matrix. Some of these sediments are underlain by outwash or till. Some of the stream bottoms have a high amount of sand which was produced by weathering of granite in upper parts of the watersheds.

VEGETATION: Undisturbed vegetation is a mixed coniferous forest. This map unit is a complex of habitat types. The major habitat types are western redcedar/queencup beadlily and wild ginger (THPL/CLUN and THPL/ASCA).

Included dissimilar habitat types are grand fir/twinflower (ABGR/LIBO) and Douglas-fir/ninebark (PSME/PHMA) which occur on drier sites and are less productive.

SOILS

Distribution: The dominant soil has a surface layer of volcanic ash 14-18 inches thick without rock fragments. Subsoils and substratums are silty with very little rock fragments. The dominant soil is a Typic Udivitrands, medial.

Other soils which occur are Andic Dystric Eutrochrepts, loamy which have a thinner volcanic ash surface layer and high subsoil base saturation, and Ochreptic Fragixeralfs, medial which has a subsurface accumulation of clay and a dense, brittle layer.

MAP UNIT MANAGEMENT INTERPRETATIONS

WATERSHED: The major watershed management concern is bank cutting by the streams flowing through these fine sediments.

ROADS: Unsurfaced roads become rutted when wet and dusty when dry. Surfacing or

seasonal closures help overcome these limitations. Frost heaving can cause road maintenance problems.

TIMBER: Timber productivity is low to moderate with potential for producing an estimated average of 50 cubic feet per acre per year under intensive management. Tractor operation can reduce productivity by compacting, displacing or rutting surface soil. This limitation can be overcome by using cable yarding systems, designated skidtrails, operating equipment when the soil is frozen or covered with several feet of snow, grapple piling and broadcast burning.

Mechanical site preparation practices which mix thin, organic matter rich, surface layers with the underlying material can cause nutrient deficiencies for tree seedlings.

Burning when surface layers are dry can cause soil damage and may reduce long-term productivity. Hot burns can create water repellent surface soils with reduced infiltration rates, greater overland flow and higher erosion potentials. Burning when the surface soil is moist prevents these impacts and helps maintain long-term productivity.

Map Unit 122 Typic Udivitrands, lacustrine substratum

MAP UNIT SUMMARY

This map unit contains low elevation, flat lying glacial lacustrine plains. Soils are somewhat poorly drained and form in volcanic ash influenced loess overlying silty lake sediments. Vegetation is mixed coniferous forest. Most delineations occur between the Pend Oreille River and Priest Lake. A few small lacustrine benches occur in the Purcell Trench around Bonners Ferry.

MAP UNIT PROPERTIES

LANDFORM: This map unit occurs as low relief lacustrine plains at elevations of 1760 to 2500 feet. Dominant slopes have gradients of 0 to 5 percent.

GEOLOGY: Substratum materials are thick, lacustrine sediments from an unnamed glacial lake. This lake was caused by an arm of the continental ice sheet. The ice moved down the Purcell Trench and one lobe moved to the west down the Pend Oreille River valley. The ice dammed the Priest River creating a lake.

These lake sediments contain little gravel or cobble and usually have a fine-silty or coarse-silty matrix. Inclusions of sandy and loamy sediments without coarse fragments occur in some areas, such as around Cottonwood Creek. Some sandy sediments have been reworked by wind. The Moores Creek portion of the Lower West Branch Priest River consists of lacustrine sediments overlying outwash. Some inclusions of till or outwash occur. The deposits found around Bonners Ferry are calcareous.

VEGETATION: Undisturbed vegetation is a mixed coniferous forest. This map unit is a complex of habitat types. The major habitat types are western redcedar/queencup beadlily and wild ginger (THPL/CLUN and THPL/ASCA).

Included dissimilar habitat types are grand fir/twinflower (ABGR/LIBO) and Douglas-fir/ninebark (PSME/PHMA) which occur on drier sites and are less productive.

SOILS

Distribution: The dominant soil is somewhat poorly drained and has a surface layer of volcanic ash 14-18 inches thick without rock fragments. Subsoils and substratums are silty with very little rock fragments. The dominant soil is a Typic Udivitrands, medial.

Other soils which occur are Andic Dystric Eutrochrepts, loamy which have a thinner volcanic ash surface layer and high subsoil base saturation, and Ochreptic Fragixeralfs, medial which has a subsurface accumulation of clay and a dense, brittle layer.

MAP UNIT MANAGEMENT INTERPRETATIONS

WATERSHED: The major watershed management concern is cutbank failure in steeper areas. This can fill ditches and culverts and provide sediment to streams.

These soils can have a perched water table. The length of time the site

will have a high water table depends upon the proximity to streams and the amount of water from adjacent uplands that is moving laterally through the area. Some area will have perched water only in the spring during snowmelt while other sites can be wetter for longer periods of time.

These lacustrine deposits consist of interbedded sand, silt and clay which have different permeabilities. These differences can concentrate ground water and produce mass movement on steeper slopes if road cuts are made in these areas.

ROADS: Unsurfaced roads become rutted when wet and dusty when dry. Surfacing or seasonal closures help overcome these limitations. Frost heaving can cause road maintenance problems. Since this unit is flat, cuts and fills are not normally built.

TIMBER: Tractor operations can reduce productivity by compacting, displacing or rutting surface soil. This limitation can be overcome by using cable yarding systems, designated skidtrails, operating equipment when the soil is frozen or covered with several feet of snow, grapple piling and broadcast burning.

Mechanical site preparation practices which mix thin, organic matter rich, surface layers with the underlying material can cause nutrient deficiencies for tree seedlings.

Burning when surface layers are dry can cause soil damage and may reduce long-term productivity. Hot burns can create water repellent surface soils with reduced infiltration rates, greater overland flow and higher erosion potentials. Burning when the surface soil is moist prevents these impacts and helps maintain long-term productivity.

The areas with prolonged perched water on top of the dense lake sediments can have limitations for tree growth. This is most likely to be a problem in low lying areas and near streams.

Map Unit 155 Typic Udivitrands, outwash and alluvial substratumMAP UNIT SUMMARY

This map unit contains low to mid elevation, stream terraces and outwash plains underlain by metasedimentary or granitic rocks. Soils form in volcanic ash influenced loess overlying alluvium or outwash. Vegetation is a mixed coniferous forest with some subalpine forests at higher elevations and in areas of cold air drainage. Delineations are mainly near major streams in the Purcell, Selkirk and Cabinet Mountains.

MAP UNIT PROPERTIES

LANDFORM: This map unit occurs on stream terraces and outwash plains at elevations of 1760 to 4800 feet. Dominant slopes gradients are 0 to 20 percent. Included are narrow, steep terrace escarpments with gradients of 50 to 75 percent. While most areas are undissected, occasional small draws may be found.

GEOLOGY: Substratum materials are alluvium and outwash derived from a variety of bedrock sources. The sediments derived from Belt rocks usually have more cobble and boulders and a greater total amount of rock fragments than those derived from granitic sources. Inclusions of till and lacustrine sediments occur.

Bedrock is argillites, siltites and quartzites from Precambrian Belt formations or granite, granidiorite or similar rocks from the Cretaceous or Tertiary aged Kaniksu batholith.

VEGETATION: Undisturbed vegetation is mainly a mixed coniferous forest. This map unit is a complex of habitat types. The major habitat types are western redcedar and western hemlock/queencup beadlily (THPL/CLUN and TSHE/CLUN). Included similar habitat types are grand fir/queencup beadlily (ABGR/CLUN), grand fir/twin flower (ABGR/LIBO) and western hemlock/oak fern (TSHE/GYDR).

Included are up to 20 percent dissimilar habitat types. Douglas-fir/snowberry, pinegrass and ninebark (PSME/SYAL, PSME/CARU and PSME/PHMA) on drier sites and are less productive. Western redcedar/devils club (THPL/OPHO) and western redcedar/lady fern (THPL/ATFI) occur in depressions and along moist draws and are more productive. Subalpine fir/beargrass (ABLA/XETE) occurs on cold, dry sites and are less productive.

SOILS

Distribution: The dominant soil has a surface layer of volcanic ash 14-18 inches thick with 5-15% rock fragments. Subsoils and substratums are very sandy and have 10 to 70 percent rock fragments. The dominant soil is a Typic Udivitrands, medial over sandy or sandy-skeletal, mixed. Similar soils have thinner volcanic ash surface layers and are Andic Dystrochrepts, sandy-skeletal, mixed. These soils occupy 85 percent of the map unit.

Included are up to 15 percent dissimilar soils. Those found at higher elevations and in frost pockets are Andic Cryochrepts, sandy-skeletal, mixed. In some areas, the volcanic ash surface layer is thin or absent and the soils are Typic Dystrochrepts and Typic Xerorthents.

MAP UNIT MANAGEMENT INTERPRETATIONS

WATERSHED: Timber harvesting and increased water yield in adjacent steep units can produce erosion if excessive water is concentrated in these erodible materials. The steep escarpment adjacent to stream terraces will have the highest potential for erosion and sediment delivery.

Stratified water deposited sediments can cause lateral water movement and seepage and erosion of cut slopes. The rounded gravel, cobble and sand moves downslope easily on cuts and fills.

Those deposits which have a high sand content and low rock fragment content are more erodible than those with more gravel and cobble.

Lightning Creek drainage in the southern Cabinet Mountains has rapid runoff from high intensity storms and/or rain on snow events. This produces major floods and damage to roads, bridges, culverts and other structures.

ROADS: Material exposed by road construction frequently has little cohesion, is droughty, erodible and difficult to revegetate. When this material is exposed in cutbanks, it moves downslope onto the roadway where it interferes with vehicle traffic and becomes a maintenance problem.

The areas with cobbly and stony sediments are sometimes good sources of aggregate and a number of gravel pits are located in this unit.

The sandy areas with few rock fragments usually have a low bearing strength and rut easily.

TIMBER: Timber productivity is high with potential for producing an estimated average of 110 cubic feet per acre per year under intensive management. Drier sites will be moderately to poorly productive.

Tractor operation can reduce productivity by compacting, displacing or rutting surface soil. This limitation can be overcome by using cable yarding systems, designated skidtrails, operating equipment when the soil is frozen or covered with several feet of snow, grapple piling and broadcast burning.

Site productivity depends on the finer textured surface layers because of coarse textured, infertile subsoils. Mechanical site preparation practices which mix thin, organic matter rich, surface layers with the underlying material can cause nutrient deficiencies for tree seedlings.

Burning when surface layers are dry can cause soil damage and may reduce long-term productivity. Hot burns can create water repellent surface soils with reduced infiltration rates, greater overland flow and higher erosion potentials. Burning when the surface soil is moist prevents these impacts and helps maintain long-term productivity.

Site productivity could be affected by the low water holding capacity of these sandy, cobbly and stony soils, especially where the volcanic ash surface soil is naturally thinner or where it is lost by management activities.

Map Unit 199 Scree/timber complex

MAP UNIT SUMMARY

This map unit contains mid to high elevation talus/scree slopes. These are usually associated with glacial scoured rock outcrop or frost shattered ridges. It occurs on steeper slopes on both granitic and Belt landscapes. Rock outcrop is sometimes associated with the talus on steeper slopes. The unit is a complex of scree and forest. Delineations occur throughout the forest.

MAP UNIT PROPERTIES

LANDFORM: This map unit occurs on moderate to steep mountain sideslopes at elevations of 4400 to 6000 feet. Dominant slopes have gradients of 35 to 60 percent. This unit usually contains less than 50 percent talus.

The talus is usually associated with rock outcrop which was scoured by the continental ice sheet and frost churned ridges in periglacial areas.

GEOLOGY: This unit contains colluvial deposits of granite, granodiorite or similar rocks from the Cretaceous or Tertiary aged Kaniksu batholith or argillite, siltite or quartzite from Precambrian Belt formations. Small areas of quartz diorite, metadiabase or gabbro are found associated with sills.

VEGETATION: The unit is a complex of forest and scree. The top of Packsaddle Mountain is largely talus produced by periglacial processes.

SOILS: This unit is a complex of scree and forest. Where soil is found, it usually has a very high rock fragment content and low water holding capacity.

MAP UNIT MANAGEMENT INTERPRETATIONS

WATERSHED: Rubble usually has low erosion hazards but rockfall or rockslide hazards can be high on steeper slopes. This material is coarse and extremely permeable. Sediment delivery efficiency is low.

ROADS: Slope steepness can increase the quantity of material excavated. Unsurfaced roads are rough and difficult to blade because of large rock fragments. Talus material is generally suitable for road aggregate when it is crushed. Select borrow will be needed for cushion.

TIMBER: This map unit is a complex of scree and forest.

Burning when surface layers are dry can cause soil damage and may reduce long-term productivity. Hot burns can create water repellent surface soils with reduced infiltration rates, greater overland flow and higher erosion potentials. Burning when the surface soil is moist prevents these impacts and helps maintain long-term productivity.

Map Unit 408 Vitric Fulvicryands - Vitric Haplocryands - Andic Cryochrepts complex, grassy balds

MAP UNIT SUMMARY

This map unit contains high elevation, grassy, mountain ridges and adjacent sideslopes which are underlain by hard or moderately hard metasedimentary rocks. Soils form in volcanic ash influenced loess overlying very cobbly material derived from the underlying bedrock. Vegetation is dry, grassy meadows with a few scattered subalpine firs. Delineations mainly occur from the St. Joe to southern Priest.

MAP UNIT PROPERTIES

LANDFORM: This map unit occurs on mountain ridges and adjacent sideslopes at elevations of 4800 to 7000 feet. Slopes are on southerly aspects with gradients ranging from 5 to 70 percent, but are dominantly 35 to 60 percent.

GEOLOGY: Bedrock is weakly weathered quartzite, siltite and argillite from Precambrian Belt formations. Inclusions of quartz diorite, gabbro and metadiabase are found associated with sills. Intrusion of the Kaniksu Batholith into the Belt rocks produced thin zones of contact metamorphism and a variety of altered rocks which occur as inclusions.

Bedrock is hard or moderately hard and weakly weathered. Upper bedrock layers are usually fractured and highly permeable to water.

VEGETATION: The majority of the unit is alpine grass meadow. The closest major habitat type is subalpine fir/beargrass (ABLA/XETE).

SOILS

Distribution: The major soils have volcanic ash influenced loess surface layers 14 to 25 inches thick. Subsoils contain 50 to 95 percent rock fragments. Soil properties vary with vegetation.

Soils under grassy vegetation have dark colored surface layers. The major soil is a Vitric Fulvicryands, medial over loamy-skeletal. A similar soil with a thinner volcanic ash surface layer is an Andic Cryumbrepts, loamy-skeletal.

Soil under forest vegetation have light colored surface layers. The major soils are Vitric Haplocryands, medial over loamy-skeletal, mixed. Similar soils have thinner volcanic ash surface layers and are Andic Cryochrepts, loamy-skeletal. These soils occupy about 85 percent of the map unit.

Included are up to 15 percent dissimilar soils. Soils with bedrock within 20 inches of the surface are on spur ridges and are Lithic Cryandepts, medial over loamy-skeletal. These soils are less productive.

Representative Profile: The major soils have a silt loam surface layer about 16 inches thick. The upper 3 inches are dark brown, silt loam and the lower 13 inches are dark yellowish brown, silt loam. Subsoils are dark yellowish brown, very gravelly sandy loams and loams about 24 inches thick. A yellowish brown, extremely gravelly sandy loam substratum overlies fractured bedrock at depths greater than 5 feet.

MAP UNIT MANAGEMENT INTERPRETATIONS

WATERSHED: No special watershed protection measures are required for management practices commonly applied to this map unit.

ROADS: These Belt rocks are not as suitable for engineering purposes as the ones in other parts of the forest. They have been altered by the many zones of contact metamorphism with the Kaniksu batholith.

TIMBER: This map unit is non-forest. Burning when soil surface layers are dry can reduce productivity. Burning only when surface layers are moist can help maintain soil productivity.

Map Unit 410 Vitric Haplocryands, mountain slopes

MAP UNIT SUMMARY

This map unit contains high elevation mountain slopes underlain by hard metasedimentary rocks. Soils form in volcanic ash influenced loess overlying very cobbly, frost churned material derived from the underlying bedrock. Vegetation is a subalpine forest on north and east aspects. Delineations mainly occur from the St. Joe to southern Priest.

MAP UNIT PROPERTIES

LANDFORM: This map unit occurs on mountain slopes at elevations of 4800 to 7000 feet. Slopes are on northerly aspects with gradients ranging from 10 to 65 percent but are dominantly 35 to 60 percent. Stream dissections are widely spaced to non-existent.

GEOLOGY: The regolith consists of frost churned material derived from the underlying bedrock.

The bedrock is weakly weathered quartzite, siltite and argillite from Precambrian Belt formations. Found in smaller amounts are quartz diorite, metadiabase and gabbro associated with sills. Intrusion of the Kaniksu Batholith into the Belt rocks produced thin zones of contact metamorphism and a variety of altered rocks which occur as inclusions.

Bedrock is hard and the upper layers are usually fractured and highly permeable to water.

VEGETATION: Undisturbed vegetation is a subalpine forest. This map unit is a complex of habitat types. The major habitat types are subalpine fir/fool's huckleberry (ABLA/MEFE) and subalpine fir/queencup beadlily (ABLA/CLUN). These habitat types occupy about 90 percent of the map unit.

Included are up to 10 percent dissimilar habitat types. Subalpine fir/beargrass (ABLA/XETE) occurs on drier micro-sites and western red cedar/queencup beadlily (THPL/CLUN) can occur at lower elevations.

SOILS

Distribution: The major soils have volcanic ash influenced loess surface layers 14 to 19 inches thick. Subsoils contain 50 to 95 percent rock fragments. Soil properties vary with vegetation and substratum properties.

The major soils under grassy vegetation are Vitric Fulvicryands, loamy-skeletal over fragmental and medial over loamy-skeletal, mixed. The major soils under forest vegetation are Vitric Haplocryands, medial over loamy-skeletal. These soils occupy about 90 percent of the map unit.

Included are up to 10 percent dissimilar soils. Soils with bedrock within 20 inches of the surface are on spur ridges and are Lithic Haplocryands, medial over loamy skeletal. These soils are less productive.

Representative Profile: The major soils have a silt loam surface layer about 17 inches thick. The upper 4 inches are dark brown, gravelly silt loam and the lower 13 inches are dark yellowish brown, gravelly to very gravelly silt loam. Subsoils are dark yellowish brown, extremely gravelly sandy loam about 18 inches thick. A yellowish brown, extremely cobbly sandy loam substratum overlies fractured bedrock at depths greater than 5 feet.

MAP UNIT MANAGEMENT INTERPRETATIONS

TIMBER: Steep slopes limit tractor operation. Cable logging systems using mid-slope roads should be considered. Heavy stands of fool's huckleberry and alder can limit forest regeneration. Rock fragments can make tree planting difficult.

ROADS: Non-rippable bedrock occasionally limits excavation.

WATERSHED: No special watershed protection measures are required for management practices commonly applied to this map unit.

Map Unit 440 Vitric Haplocryands, broadly convex ridgesMAP UNIT SUMMARY

This map unit contains high elevation, broadly convex ridgetops, with northerly aspects, which are underlain by hard or moderately hard metamorphic rocks. Soils form in a thick mantle of volcanic ash influenced loess overlying very cobbly material derived from the underlying bedrock. Vegetation is subalpine forest. Delineations occur mainly in Precambrian Belt rock drainages within the Coeur d' Alene and St. Joe mountains. A small amount occurs in southern Priest.

MAP UNIT PROPERTIES

LANDFORM: This map unit occurs on broadly convex ridgetops at elevations of 5100 to 7000 feet. Slopes are on northerly aspects with gradients ranging from 0 to 40 percent, but are dominantly 10 to 35 percent.

GEOLOGY: This map unit consists of volcanic ash influenced loess overlying Precambrian Belt rock from a variety of formations. Quartzite and siltite are most common. Bedrock is hard or moderately hard and weakly weathered. Upper bedrock layers are usually fractured and highly permeable to water.

VEGETATION: Major habitat types are subalpine fir/fool's huckleberry (ABLA/MEFE) and subalpine fir/queen cup beadlily (ABLA/CLUN). These habitat types occupy about 90 percent of the map unit. Included are up to 10 percent dissimilar habitat types. Subalpine fir/beargrass (ABLA/XETE) occurs on dryer micro-sites.

SOILS

Distribution: The major soils have volcanic ash influenced loess surface layers 14 to 20 inches thick. The lower part of the surface layer contains 10 to 65 percent rock fragments. Sandy loam subsoil textures are associated with soils underlain by quartzite and some siltites. Other soils underlain by siltite have loam or silt loam textures. Subsoils contain 45 to 80 percent rock fragments. The major soils are Vitric Haplocryands, medial over loamy-skeletal, mixed. Similar soils have higher rock fragment contents (35 to 65 percent) within the volcanic ash influenced surface layers. They are Vitric Haplocryands, loamy-skeletal, mixed. These soils occupy about 85 percent of the map unit.

Included are up to 15 percent dissimilar soils. Soils with more than 85 percent subsoil rock fragments occur randomly, along with soils that have less surface volcanic ash accumulations. These soils are less productive. They are Vitric Haplocryands, medial-skeletal and Andic Cryochrepts, loamy-skeletal, mixed. Soils with less than 35 percent subsoil rock fragments and soils with clay accumulation in the subsoil are more productive. They are Vitric Haplocryands, medial over loamy, mixed and Andeptic Cryoboralfs, medial over loamy, mixed.

Representative Profile: The major soils have a silt loam surface layer about 16 inches thick. The upper 4 inches are dark brown, gravelly silt loam and the lower 12 inches are dark yellowish brown, gravelly to very gravelly silt

loam. Subsoils are dark yellowish brown, very cobbly to extremely cobbly sandy loam about 18 inches thick. a yellowish brown, extremely cobbly sandy loam substratum overlies fractured bedrock at depths greater than 5 feet.

MAP UNIT MANAGEMENT INTERPRETATIONS

WATERSHED: No special watershed protection measures are required for management practices commonly applied to this map unit.

ROADS: No special road construction practices are required in this map unit. Brush tends to encroach on roads.

TIMBER: The terrain is well suited to tractor operation. Timber management practices which compact, mix or displace the surface few inches of volcanic ash can reduce site productivity. Heavy stands of fool's huckleberry and alder can limit forest regeneration. Rock fragments can make tree planting difficult.

Map Unit 441 Vitric Haplocryands - Rock Outcrop association, broadly convex ridges

MAP UNIT SUMMARY

This map unit contains high elevation, broadly convex ridges, with southerly aspects, which are underlain by hard metasedimentary rocks. Soils form in volcanic ash influenced loess overlying very cobbly material derived from the underlying bedrock. Vegetation is a dry subalpine forest on south and west aspects. Delineations mainly occur from the St. Joe to southern Priest.

MAP UNIT PROPERTIES

LANDFORM: This map unit occurs on mountain slopes at elevations of 5100 to 7000 feet. Slopes are on southerly aspects with gradients ranging from 0 to 40 percent but are dominantly 10 to 35 percent.

GEOLOGY: The bedrock is weakly weathered quartzite, siltite and argillite from Precambrian Belt formations. Found in smaller amounts are quartz diorite, metadiabase and gabbro associated with sills. Intrusion of the Kaniksu Batholith into the Belt rocks produced thin zones of contact metamorphism and a variety of altered rocks which occur as inclusions.

Bedrock is hard and the upper layers are usually fractured and highly permeable to water.

VEGETATION: Undisturbed vegetation is subalpine forest. This map unit is a complex of habitat types. The major habitat types are subalpine fir/beargrass (ABLA/XETE) and subalpine fir/queencup beadlily (ABLA/CLUN). These habitat types occupy about 90 percent of the map unit.

Included are up to 10 percent dissimilar habitat types. Subalpine fir/fools huckleberry (ABLA/MEFE) occurs on micro-sites and grand fir/blue huckleberry (ABGR/VAGL) can occur at lower elevations.

SOILS

Distribution: The major soils have volcanic ash influenced loess surface layers 14 to 20 inches thick. Subsoils contain 45 to 80 percent rock fragments. Soil properties vary with substratum characteristics. Sandy loam subsoil textures are associated with soils underlain by quartzite and some siltites. Soils underlain by some siltites and argillites have loam or silt loam textures.

The major soils are Vitric Haplocryands, medial over loamy-skeletal, mixed. Similar soils have thinner volcanic ash surface layers and are Andic Cryochrepts, loamy-skeletal, mixed. These soils occupy about 85 percent of the map unit.

Included are up to 15 percent dissimilar soils. Soils with bedrock within 20 inches of the surface are Lithic Haplocryands, loamy-skeletal, mixed.

Representative Profile: The major soils have a silt loam surface layer

about 16 inches thick. The upper 4 inches are dark brown, gravelly silt loam and the lower 12 inches are dark yellowish brown, gravelly to very gravelly silt loam. Subsoils are dark yellowish brown, very cobbly to extremely cobbly sandy loam about 18 inches thick. A yellowish brown, very cobbly to extremely cobbly sandy loam substratum overlies fractured bedrock at depths greater than 5 feet.

MAP UNIT MANAGEMENT INTERPRETATIONS

WATERSHED: No special watershed protection measures are required for management practices commonly applied to this map unit.

ROADS: No special road construction practices are required in this map unit.

TIMBER: The terrain is well suited to tractor operation. Timber management practices which compact, mix or displace the surface few inches of volcanic ash can reduce site productivity. Rock fragments make tree planting difficult in some areas. Burning when soil surface layers are dry can reduce productivity. Burning only when surface layers are moist can help maintain soil productivity.

Map Unit 466 Typic Udivitrands, mountain slopes

MAP UNIT SUMMARY

This map unit contains low to mid-elevation mountain slopes underlain by highly fractured, hard to moderately hard metamorphic rocks. Soils form in volcanic ash influenced loess overlying very gravelly material derived from the underlying bedrock. Vegetation is mixed coniferous forest. Delineations mainly occur from the St. Joe to southern Priest.

MAP UNIT PROPERTIES

LANDFORM: This map unit occurs on mountain slopes at elevations of 3400 to 5000 feet. Slopes are on northerly aspects with gradients ranging from 15 to 70 percent, but are dominantly 35 to 60 percent. Stream dissections are widely spaced to non-existent.

GEOLOGY: The bedrock is weakly weathered quartzite, siltite and argillite from Precambrian Belt formations. Found in smaller amounts are quartz diorite, metadiabase and gabbro associated with sills. Intrusion of the Kaniksu Batholith into the Belt rocks produced thin zones of contact metamorphism and a variety of altered rocks which occur as inclusions.

Bedrock is hard and the upper layers are usually fractured and highly permeable to water.

VEGETATION: Undisturbed vegetation is a mixed coniferous forest. This map unit is a complex of habitat types. The major habitat types are western red cedar and western hemlock/queen cup beadlily (THPL/CLUN and TSHE/CLUN).

Included are up to 15 percent dissimilar habitat types. Western red cedar/lady fern, devils club and oak fern (THPL/ATFI, THPL/OPHO and THPL/GYDR) occur along the few moist draws that occur in this unit. They are more productive and are associated with water tables.

SOILS

Distribution: The dominant soil has a silt loam surface layer 14 to 22 inches thick derived from volcanic ash influenced loess. Subsoils contain 10 to 55 percent rock fragments. The dominant soil is a Typic Udivitrands, medial over loamy-skeletal, mixed, frigid. Similar soils have surface ash layers 7 to 14 inches thick and are Andic Dystrochrepts, loamy-skeletal, mixed, frigid. These soils occupy about 90 percent of the map unit.

Included are up to 10 percent dissimilar soils. Soils near moist draws and seeps tend to be more productive and are Humic Udivitrands, medial over loamy-skeletal, mixed, frigid.

Representative Profile: The major soils have a silt loam surface layer about 16 inches thick. The upper 3 inches are dark brown, silt loam and the lower 13 inches are dark yellowish brown, silt loam. Subsoils are dark yellowish brown, very gravelly sandy loams and loams about 24 inches thick. A yellowish brown, extremely gravelly sandy loam substratum overlies fractured bedrock at depths greater than 5 feet.

MAP UNIT MANAGEMENT INTERPRETATIONS

WATERSHED: No special watershed protection measures are required for management practices commonly applied to this map unit.

ROADS: These Belt rocks are not as suitable for engineering purposes as the ones in other parts of the forest. They have been altered by the many zones of contact metamorphism with the Kaniksu batholith. Non-rippable bedrock occasionally limits excavation.

TIMBER: Steeper slopes limit tractor operations. In places rock fragments can make tree planting difficult.

Map Unit 467 Typic Udivitrands - Humic Udivitrands complex, mountain toeslopes and stream bottoms

MAP UNIT SUMMARY

This map unit contains low to mid-elevation mountain slopes adjacent to stream drainages, and is underlain by hard metasedimentary rocks. Soils form in volcanic ash influenced loess over very cobbly material derived from the underlying bedrock. Vegetation is a mosaic of dry and wet mixed coniferous forest with some brushy openings and fern glades. Delineations mainly occur from the St. Joe to southern Priest.

MAP UNIT PROPERTIES

LANDFORM: This map unit occurs on mountain slopes at elevations of 3200 to 5000 feet. Slopes are on northerly aspects with gradients ranging from 15 to 65 percent, but are dominantly 35 to 55 percent. Slopes are dissected by numerous discernable 1st and 2nd order drainages.

GEOLOGY: The bedrock is weakly weathered quartzite, siltite and argillite from Precambrian Belt formations. Found in smaller amounts are quartz diorite, metadiabase and gabbro associated with sills. Intrusion of the Kaniksu Batholith into the Belt rocks produced thin zones of contact metamorphism and a variety of altered rocks which occur as inclusions.

Bedrock is hard and the upper layers are usually fractured and highly permeable to water.

VEGETATION: Undisturbed vegetation is a mixed coniferous forest. This map unit is a complex of habitat types. Spur ridges and adjacent upper sideslopes are western redcedar/queencup beadlily (THPL/CLUN) and western redcedar/wild ginger (THPL/ASCA). Included similar habitat types are western hemlock/queencup beadlily (TSHE/CLUN) and western hemlock/wild ginger (TSHE/ASCA). These habitat types occupy about 45 percent of the unit.

Depressional areas, draws and sideslopes adjacent to draws are dominantly western redcedar/lady fern (THPL/ATFI), western redcedar/devils club (THPL/OPHO) and western redcedar/oak fern (THPL/GYDR). Western hemlock/oakfern (TSHE/GYDR) is similar. These habitat types occupy about 40 percent of the map unit. About 15 percent of the unit contains fern glades.

SOILS

Distribution: The dominant soil has a silt loam surface layer 14 to 22 inches thick derived from volcanic ash influenced loess. Subsoils contain 10 to 55 percent rock fragments. The dominant soil is a Typic Udivitrands, medial over loamy-skeletal, mixed, frigid. Similar soils have surface ash layers 7 to 14 inches thick and are Andic Dystrochrepts, loamy-skeletal, mixed, frigid. These soils occupy about 90 percent of the map unit.

Included are up to 10 percent dissimilar soils. Soils near moist draws and seeps tend to be more productive and are Humic Udivitrands, medial over loamy-skeletal, mixed, frigid.

Representative Profile: The major soils have a silt loam surface layer about 16 inches thick. The upper 3 inches are dark brown, silt loam and the lower 13 inches are dark yellowish brown, silt loam. Subsoils are dark yellowish brown, very gravelly sandy loams and loams about 24 inches thick. A yellowish brown, extremely gravelly sandy loam substratum overlies fractured bedrock at depths greater than 5 feet.

MAP UNIT MANAGEMENT INTERPRETATIONS

WATERSHED: This map unit has drainage classes ranging from well drained to poorly drained. It also reflects an increase in the number of drainages due to the restriction in subsurface water movement and because of the dominant bottom and toeslope position in the landscape. Sediment and water delivery to streams has a rating of moderate to high.

Erosion and mass failure potentials are moderate. These problems can be partially mitigated through the proper location, sizing, installation and maintenance of culverts; Use of filter windrows along the bottom of the road fill going into and coming out of all draws; and implementing prompt revegetation of road cut and fills. On larger road cuts, especially where roads cut through draws, cutbank failures can occur. Gabions, retaining walls or other structures may be required to stabilize some areas. They must be stabilized before they can be revegetated.

ROADS: Excavation can intercept large amounts of ground water in depressional areas, draws, sideslopes adjacent to draws and cutbanks tend to slough in these areas. Unsurfaced roads are rough and difficult to blade because of large rock fragments. Brush will encroach on roads.

These Belt rocks are not as suitable for engineering purposes as the ones in other parts of the forest. They have been altered by the many zones of contact metamorphism with the Kaniksu batholith.

TIMBER: Moderate to steep slopes limit tractor operations. Competition from menziesia, alder and other brush species can limit forest regeneration especially in depressional areas, on lower sideslopes, and along drainages. Regeneration of fern glades produces severe problems. Timber harvest in areas adjacent to fern glades can increase the size of the fern glade and compound the regeneration problem. Windthrow hazard is associated with high water tables.

Map Unit 468 Typic Udivitrands, mountain toeslopes and stream bottoms, dry

MAP UNIT SUMMARY

This map unit contains low to mid-elevation mountain slopes adjacent to stream drainages and is underlain by hard metasedimentary rocks. Soils form in volcanic ash influenced loess over very gravelly material derived from the underlying bedrock. Soils are well drained even in the draw bottoms. Vegetation is a mosaic of dry and moist, mixed, coniferous forest. Delineations mainly occur from the St. Joe to southern Priest.

MAP UNIT PROPERTIES

LANDFORM: This map unit occurs on mountain slopes at elevations of 3200 to 5000 feet. Slopes are on southerly aspects with gradients ranging from 15 to 65 percent, but are dominantly 35 to 55 percent. Slopes are dissected by numerous discernable 1st and 2nd order drainages.

GEOLOGY: The bedrock is weakly weathered quartzite, siltite and argillite from Precambrian Belt formations. Found in smaller amounts are quartz diorite, metadiabase and gabbro associated with sills. Intrusion of the Kaniksu Batholith into the Belt rocks produced thin zones of contact metamorphism and a variety of altered rocks which occur as inclusions.

Bedrock is hard and the upper layers are usually fractured and highly permeable to water.

VEGETATION: Undisturbed vegetation is a mixed coniferous forest. This map unit is a complex of habitat types. Spur ridges and adjacent upper sideslopes are western redcedar and western hemlock/queencup beadlily (THPL/CLUN and TSHE/CLUN). Included are up to 15 percent dissimilar habitat types. Western red cedar/lady fern, devils club and oak fern (THPL/ATFI, THPL/OPHO and THPL/GYDR) occur along moist draws. They are more productive and are associated with water tables.

SOILS

Distribution: The dominant soil has a silt loam surface layer 14 to 22 inches thick derived from volcanic ash influenced loess. Subsoils contain 10 to 55 percent rock fragments. The dominant soil is a Typic Udivitrands, medial over loamy-skeletal, mixed, frigid. Similar soils have surface ash layers 7 to 14 inches thick and are Andic Dystrochrepts, loamy-skeletal, mixed, frigid. These soils occupy about 90 percent of the map unit.

Included are up to 10 percent dissimilar soils. Soils near moist draws and seeps tend to be more productive and are Humic Udivitrands, medial over loamy-skeletal, mixed, frigid.

Representative Profile: The major soils have a silt loam surface layer about 16 inches thick. The upper 3 inches are dark brown, silt loam and the lower 13 inches are dark yellowish brown, silt loam. Subsoils are dark yellowish brown, very gravelly sandy loams and loams about 24 inches thick. A yellowish

brown, extremely gravelly sandy loam substratum overlies fractured bedrock at depths greater than 5 feet.

MAP UNIT MANAGEMENT INTERPRETATIONS

WATERSHED: Drainage classes in this map unit are mostly well drained, but some poorly drained sites occur. This map unit reflects an increase in the number of drainages due to the bottom and toeslope landscape position and some restrictions in subsurface water movement.

Sediment and water delivery will be moderate near drainages and increased sediment yield from roads can occur. Erosion and mass failure potentials are low to moderate. Sedimentation, erosion and mass failure problems can generally be mitigated through the proper location, sizing, installation and maintenance of culverts; Use of filter windrows along the bottom of the road fill going into and coming out of wet draws; and good revegetation of road cut and fills.

ROADS: Excavation can intercept some ground water in depressional areas, draws, and on sideslopes adjacent to draws. Unsurfaced roads can be rough and difficult to blade because of large rock fragments. Brush will encroach on roads in the moist and wet areas.

These Belt rocks are not as suitable for engineering purposes as the ones in other parts of the forest. They have been altered by the many zones of contact metamorphism with the Kaniksu batholith.

TIMBER: Moderate to steep slopes limit tractor operation. Cable yarding systems using mid slope roads should be considered. Solar insolation limits forest regeneration on the dryer habitat types. High rock fragment contents in areas makes tree planting difficult. Burning when soil surface layers are dry can reduce productivity. Burning only when surface layers are moist can help maintain soil productivity.

Map Unit 470 Typic Udivitrands, mountain slopes, dry

MAP UNIT SUMMARY

This map unit contains low- to mid-elevation mountain slopes underlain by hard or moderately hard metamorphic rocks. Soils form in a thick mantle of volcanic ash influenced loess overlying very gravelly material derived from the underlying bedrock. Vegetation is a mixed coniferous forest. Delineations mainly occur from the St. Joe to southern Priest.

MAP UNIT PROPERTIES

LANDFORM: This map unit occurs on mountain slopes at elevations of 3200 to 5000 feet. Slopes are on southerly aspects with gradients ranging from 10 to 65 percent but are dominantly 35 to 55 percent.

GEOLOGY: The bedrock is weakly weathered quartzite, siltite and argillite from Precambrian Belt formations. Found in smaller amounts are quartz diorite, metadiabase and gabbro associated with sills. Intrusion of the Kaniksu Batholith into the Belt rocks produced thin zones of contact metamorphism and a variety of altered rocks which occur as inclusions.

Bedrock is hard and the upper layers are usually fractured and highly permeable to water.

VEGETATION: Undisturbed vegetation is a mixed, coniferous forest. This unit is a complex of habitat types. Grand fir, western redcedar and western hemlock/queen cup beadlily (ABGR/CLUN, THPL/CLUN AND TSHE/CLUN) occur on moist sites and are more productive. Grand fir and Douglas-fir/ninebark (ABGR/PHMA and PSME/PHMA) occur on dry, rocky sites and are less productive.

SOILS

Distribution: The dominant soil has a silt loam surface layer 14 to 22 inches thick derived from volcanic ash influenced loess. Subsoils contain 10 to 55 percent rock fragments. The dominant soil is a Typic Udivitrands, medial over loamy-skeletal, mixed, frigid. Similar soils have surface ash layers 7 to 14 inches thick and are Andic Dystrochrepts, loamy-skeletal, mixed, frigid. These soils occupy about 90 percent of the map unit.

Included are up to 10 percent dissimilar soils. Soils near moist draws and seeps tend to be more productive and are Humic Udivitrands, medial over loamy-skeletal, mixed, frigid.

Representative Profile: The major soils have a silt loam surface layer about 16 inches thick. The upper 3 inches are dark brown, silt loam and the lower 13 inches are dark yellowish brown, silt loam. Subsoils are dark yellowish brown, very gravelly sandy loams and loams about 24 inches thick. A yellowish brown, extremely gravelly sandy loam substratum overlies fractured bedrock at depths greater than 5 feet.

MAP UNIT MANAGEMENT INTERPRETATIONS

WATERSHED: No special watershed protection measures are required for management practices commonly applied to this map unit.

TIMBER: Steep slopes limit tractor operation. Cable logging systems using mid-slope roads should be considered. Solar insolation limits forest regeneration. Rock fragments make tree planting difficult. Burning when soil surface layers are dry can reduce productivity. Burning only when surface layers are moist can help maintain soil productivity.

ROADS: These Belt rocks are not as suitable for engineering purposes as the ones in other parts of the forest. They have been altered by the many zones of contact metamorphism with the Kaniksu batholith. Non-rippable bedrock occasionally limits excavation.

Map Unit 471 Typic Vitrandept (xeric) - Rock Outcrop complex, mountain slopes

MAP UNIT SUMMARY

This map unit is located on low to mid elevation mountain slopelands with southerly aspects. Soil depths range from exposed bedrock to deep soil profiles with high rock fragment contents. Soils are somewhat excessively drained. Delineations mainly occur from the St. Joe to southern Priest.

MAP UNIT PROPERTIES

LANDFORM: This map unit occurs on mountain slopes at elevations of 3200 to 5000 feet. Slopes are on southerly aspects with gradients ranging from 30 to 70 percent with a dominant range of 45 to 65 percent and a mean of 54 percent. This unit contains 15 percent rock outcrop.

GEOLOGY: The bedrock is weakly weathered quartzite, siltite and argillite from Precambrian Belt formations. Found in smaller amounts are quartz diorite, metadiabase and gabbro associated with sills. Intrusion of the Kaniksu Batholith into the Belt rocks produced thin zones of contact metamorphism and a variety of altered rocks which occur as inclusions.

Bedrock is hard and the upper layers are usually fractured and highly permeable to water.

VEGETATION: Undisturbed vegetation is a dry, mixed coniferous forest. This map unit is a complex of habitat types. The major habitat types on these dry slopelands are grand fir/ninebark (ABGR/PHMA) and Douglas-fir/ninebark (PSME/PHMA).

A minor habitat type is grand fir/wild ginger (ABGR/ASCA) which occurs in and along the few wet draws. Grand fir/queen cup beadlily (ABGR/CLUN) can also be found in some moist microsites.

SOILS

Distribution: The dominant soil has a silt loam surface layer 14 to 22 inches thick derived from volcanic ash influenced loess. Subsoils contain 10 to 55 percent rock fragments. The dominant soil is a Typic Udivitrands, medial over loamy-skeletal, mixed, frigid. Similar soils have surface ash layers 7 to 14 inches thick and are Andic Dystrochrepts, loamy-skeletal, mixed, frigid. These soils occupy about 90 percent of the map unit.

Included are up to 10 percent dissimilar soils. Soils near moist draws and seeps tend to be more productive and are Humic Udivitrands, medial over loamy-skeletal, mixed, frigid.

Representative Profile: The major soils have a silt loam surface layer about 16 inches thick. The upper 3 inches are dark brown, silt loam and the lower 13 inches are dark yellowish brown, silt loam. Subsoils are dark yellowish brown, very gravelly sandy loams and loams about 24 inches thick. A yellowish brown, extremely gravelly sandy loam substratum overlies fractured bedrock at depths greater than 5 feet.

MAP UNIT MANAGEMENT INTERPRETATIONS

WATERSHED: Burning has moderate erosion hazards. Some soil erosion has been observed following intense wildfire. The erosion hazard resulting from prescribed fire should be evaluated before planning broadcast burning. Line skidding corridors and firelines have moderate erosion hazards. Roads have low erosion hazards. Timber harvest, burning and road construction have low potential for causing landslides except on oversteepened slopes adjacent to incised draws where the potential is moderate. Sediment delivery efficiency is moderate.

ROADS: Roads have a low potential for increasing the frequency of landslides, except along incised draws. Non-rippable bedrock occasionally limits excavation. Native road surfaces can be rough due to the high amount of rock fragments.

These Belt rocks are not as suitable for engineering purposes as the ones in other parts of the forest. They have been altered by the many zones of contact metamorphism with the Kaniksu batholith.

TIMBER: Steep slopes limit tractor operations. Cable systems using mid-slope roads should be considered. Site productivity depends on the relatively thin, finer textured soil surface volcanic ash layer. Timber management practices which compact, mix or displace the surface layer can reduce site productivity. Solar insolation, brush competition and high rock fragment contents in the soil limits forest regeneration.

Map Unit 477 Typic Udivitrands - Eutric Glossoboralfs complex, stream breaklands

MAP UNIT SUMMARY

This map unit contains low to mid-elevation mountain slopes adjacent to stream drainages. It is underlain by hard metasedimentary rocks. Soils form in volcanic ash influenced loess over very cobbly to extremely cobbly material derived from the underlying bedrock. Soils on spur ridges and some adjacent upper sideslopes are usually well drained. Depressional areas and sideslopes adjacent to draws contain fluctuating water tables. Vegetation is a mosaic of dry and wet mixed coniferous forest with some brushy openings. Delineations mainly occur from the St. Joe to southern Priest.

MAP UNIT PROPERTIES

LANDFORM: This map unit occurs on dissected stream breaklands at elevations of 3200 to 5000 feet. Slopes are on northerly aspects with gradients ranging from 50 to 90 percent, but are dominantly 60 to 80 percent. Slopes are dissected by numerous discernable 1st and 2nd order drainages.

GEOLOGY: The bedrock is weakly weathered quartzite, siltite and argillite from Precambrian Belt formations. Found in smaller amounts are quartz diorite, metadiabase and gabbro associated with sills. Intrusion of the Kaniksu Batholith into the Belt rocks produced thin zones of contact metamorphism and a variety of altered rocks which occur as inclusions.

Bedrock is hard and the upper layers are usually fractured and highly permeable to water.

VEGETATION: Undisturbed vegetation is a mixed coniferous forest. This map unit is a complex of habitat types. Spur ridges and adjacent upper sideslopes are western redcedar/queencup beadlily and wild ginger (THPL/CLUN and THPL/ASCA). Included similar habitat types are western hemlock/queencup beadlily and wild ginger (TSHE/CLUN and TSHE/ASCA).

Depressional areas, draws and sideslopes adjacent to draws are dominantly western redcedar/devils club, lady fern and oak fern (THPL/OPHO, THPL/ATFI and THPL/GYDR). Western hemlock/oak fern (TSHE/GYDR) is similar.

SOILS

Distribution: The dominant soil has a silt loam surface layer 14 to 22 inches thick derived from volcanic ash influenced loess. Subsoils contain 10 to 55 percent rock fragments. The dominant soil is a Typic Udivitrands, medial over loamy-skeletal, mixed, frigid. Similar soils have surface ash layers 7 to 14 inches thick and are Andic Dystrochrepts, loamy-skeletal, mixed, frigid. These soils occupy about 90 percent of the map unit.

Included are up to 10 percent dissimilar soils. Soils near moist draws and seeps tend to be more productive and are Humic Udivitrands, medial over loamy-skeletal, mixed, frigid.

Representative Profile: The major soils have a silt loam surface layer

about 16 inches thick. The upper 3 inches are dark brown, silt loam and the lower 13 inches are dark yellowish brown, silt loam. Subsoils are dark yellowish brown, very gravelly sandy loams and loams about 24 inches thick. A yellowish brown, extremely gravelly sandy loam substratum overlies fractured bedrock at depths greater than 5 feet.

MAP UNIT MANAGEMENT INTERPRETATIONS

WATERSHED: This map unit has drainage classes ranging from well drained to poorly drained. It also reflects an increase in the number of drainages due to the restriction in subsurface water movement and because of the dominant bottom and steep toeslope position in the landscape. Sediment and water delivery to streams has a high rating. Line skidding corridors and firelines have moderate erosion hazards. Roads have low to moderate erosion hazards.

Road construction has a high potential for causing landslides or cutbank slumps, especially where roads cut through draws. These problems can be partially mitigated through the proper location, sizing, installation and maintenance of culverts. Sediment delivery can be partially mitigated by use of filter windrows along the bottom of the road fill going into and coming out of all draws; and implementing prompt revegetation of road cut and fills.

ROADS: Roads have a high potential for increasing the frequency of landslides. Excavation can intercept large amounts of ground water in depressional areas, draws, sideslopes adjacent to draws and cutbanks tend to slough in these areas. Slope steepness increases the quantity of material excavated. Non-rippable bedrock occasionally limits excavation. Unsurfaced roads can be rough and difficult to blade because of large rock fragments. Brush will encroach on roads.

These Belt rocks are not as suitable for engineering purposes as the ones in other parts of the forest. They have been altered by the many zones of contact metamorphism with the Kaniksu batholith.

TIMBER: Steep slopes limit tractor operations. Competition from menziesia, alder and other brush species can limit forest regeneration especially in depressional areas, on lower sideslopes, and along drainages. Windthrow hazard is associated with high water tables.

Map Unit 478 Rock outcrop - Typic Vitrandept (xeric) complex, stream breaklands

MAP UNIT SUMMARY

These units are located on low to mid elevation, steep, mountain slopes, adjacent to stream drainages, with southerly aspects. Soil depths range from exposed bedrock to deep soil profiles with high rock fragment contents. The vegetation consists of dry, mixed coniferous forest, with some brushy openings. Delineations mainly occur from the St. Joe to southern Priest.

MAP UNIT PROPERTIES

LANDFORM: This map unit occurs on stream breaklands at elevations of 3200 to 5000 feet. Slopes are on southerly aspects with gradients ranging from 50 to 95 percent but are dominantly 60 to 80 percent. The unit has 25 percent rock outcrop.

GEOLOGY: The bedrock is weakly weathered quartzite, siltite and argillite from Precambrian Belt formations. Found in smaller amounts are quartz diorite, metadiabase and gabbro associated with sills. Intrusion of the Kaniksu Batholith into the Belt rocks produced thin zones of contact metamorphism and a variety of altered rocks which occur as inclusions.

Bedrock is hard and the upper layers are usually fractured and highly permeable to water.

VEGETATION: Undisturbed vegetation is a dry mixed coniferous forest. This map unit is a complex of habitat types. The major habitat types on these dry breaklands are grand fir/ninebark (ABGR/PHMA), and Douglas-fir/ninebark and blue huckleberry (PSME/PHMA and PSME/VAGL).

Inclusions of grand fir/wild ginger (ABGR/ASCA) occur in and along the few wet draws. Grand fir/queen cup beadlily (ABGR/CLUN) can be found in some moist microsites.

SOILS

Distribution: The dominant soil has a silt loam surface layer 14 to 22 inches thick derived from volcanic ash influenced loess. Subsoils contain 10 to 55 percent rock fragments. The dominant soil is a Typic Udivitrands, medial over loamy-skeletal, mixed, frigid. Similar soils have surface ash layers 7 to 14 inches thick and are Andic Dystrochrepts, loamy-skeletal, mixed, frigid. These soils occupy about 90 percent of the map unit.

Included are up to 10 percent dissimilar soils. Soils near moist draws and seeps tend to be more productive and are Humic Udivitrands, medial over loamy-skeletal, mixed, frigid.

Representative Profile: The major soils have a silt loam surface layer about 16 inches thick. The upper 3 inches are dark brown, silt loam and the lower 13 inches are dark yellowish brown, silt loam. Subsoils are dark yellowish brown, very gravelly sandy loams and loams about 24 inches thick. A yellowish brown, extremely gravelly sandy loam substratum overlies fractured bedrock at depths greater than 5 feet.

MAP UNIT MANAGEMENT INTERPRETATIONS

WATERSHED: This map unit is mostly well drained. Sediment and water delivery to streams has a high rating. Roads have low to moderate erosion hazards. Road construction has a moderate to high potential for causing landslides or cutbank slumps, especially where roads cut through draws. These problems can be partially mitigated through the proper location, sizing, installation and maintenance of culverts. Sediment delivery can be partially mitigated by use of filter windrows along the bottom of the road fill going into and coming out of all draws; and implementing prompt revegetation of road cut and fills.

ROADS: Roads have a moderate to high potential for increasing the frequency of landslides. Non-rippable bedrock occasionally limits excavation. Native road surfaces can be rough due to the high amount of rock fragments.

These Belt rocks are not as suitable for engineering purposes as the ones in other parts of the forest. They have been altered by the many zones of contact metamorphism with the Kaniksu batholith.

TIMBER: Potential annual production is low and large portions of this unit are unsuitable for timber production. Site productivity depends on the relatively thin, finer textured soil surface volcanic ash layer. Timber management practices which compact, mix or displace the surface layer can reduce site productivity. Steep slopes, solar insolation, brush competition and high rock fragment contents in the soil limits forest regeneration. Burning when soil surface layers are dry can reduce productivity. Burning only when surface layers are moist can help maintain soil productivity.

MAP UNIT 483 Typic Udivitrands (xeric) - Typic Udivitrands, stream breaklands

MAP UNIT SUMMARY

These units are located on low to mid elevation, steep, mountain slopes, adjacent to stream drainages, with southerly aspects. Soils form in volcanic ash influenced loess over very cobbly to extremely cobbly material derived from the underlying bedrock. Soils are well drained. The vegetation consists of dry mixed coniferous forest, with some brushy openings. Delineations occur mainly in Precambrian Belt rock drainages within the Coeur d' Alene and St Joe mountains. A small amount occurs in southern Priest.

MAP UNIT PROPERTIES

LANDFORM This map unit occurs on stream breaklands at elevations of 3200 to 5000 feet. Slopes are on southerly aspects with gradients ranging from 50 to 95 percent, but are dominantly 60 to 80 percent.

GEOLOGY Bedrock is dominantly Precambrian Belt rock from a variety of formations. Bedrock is hard or moderately hard and weakly weathered.

VEGETATION This map unit is a complex of habitat types. The major habitat types on these dry breaklands are grand fir/ninebark and Douglas-fir/ninebark occurring on the driest sites. On the moister sites grand fir/beargrass and grand fir/blue huckleberry occurs. These habitat types occupy about 90 percent of the unit.

Inclusions of grand fir/wild ginger and even western redcedar-western hemlock habitat types can occur in and along the few wet draws, and along the wet toeslopes. Grand fir/queen cup beadlily can also be found in some of the more moist microsites. These inclusions make up about 10 percent of the unit.

SOILS

Distribution This map unit is a complex of soils with volcanic ash surface layers ranging from 10 to 20 inches thick and have silt loam textures. The lower part of the surface ash layer contains 25 to 65 percent rock fragments. Sandy loam and fine sandy loam subsoil textures are associated with soils underlain by quartzite and some siltites. Other soils underlain by siltite have silt loam textures. Subsoils contain 55 to 95 percent angular rock fragments. The major soils are Typic Udivitrands, loamy-skeletal, mixed, frigid (xeric phase) on the dryer sites, and Typic Udivitrands, loamy-skeletal, mixed, frigid, on the moister sites. Similar soils have lower rock fragment contents within the volcanic ash influenced surface layers. They are Typic Udivitrands, medial over loamy-skeletal, mixed, frigid (xeric phase), and Typic Udivitrands, medial over loamy-skeletal, mixed, frigid. These soils occupy about 75 percent of the map unit

Included are up to 25 percent dissimilar soils. Soils with extremely high rock fragment content in the subsoil are Typic Udivitrands, medial-skeletal, mixed, frigid (xeric phase). Soils with a surface ash thickness less than 14 inches are Andic Dystrachrepts, loamy-skeletal, mixed, frigid. Soils with bedrock within 20

inches of the surface are Lithic Vitrandepts, loamy-skeletal, mixed, frigid (xeric phase). All of the above mentioned, included soils, are less productive than the major soils of this unit. Included soils which are more productive than the major soils are Ultic Haploxeralfs, loamy-skeletal, mixed, frigid and Eutric Glossoboralfs, loamy-skeletal, mixed. These soils have subsoil clay accumulations. Inclusions of rock outcrop also occur.

Representative Profiles The dominant soils have a surface volcanic ash layer which is a dark brown very gravelly silt loam about 4 inches thick. Subsurface volcanic ash layers are brown very cobbly silt loam about 12 inches thick. Subsoils are dark yellowish brown extremely cobbly sandy loam about 12 inches thick. A yellowish brown extremely cobbly sandy loam substratum overlies fractured bedrock at depths greater than 5 feet

MAP UNIT MANAGEMENT INTERPRETATIONS

WATERSHED This map unit is mostly well drained. Sediment delivery to streams is high and water delivery is very high. Roads have low to moderate erosion hazards. Road construction has a moderate to high potential for causing landslides or cutbank slumps. These problems can be partially mitigated through the proper location, sizing, installation and maintenance of culverts. Sediment delivery can be partially mitigated by use of filter windrows along the bottom of the road fill where sediment has easy access to streams; and implementing prompt revegetation of road cut and fills.

ROADS Roads have a moderate to high potential for increasing the frequency of landslides. Non-rippable bedrock occasionally limits excavation. Native road surfaces can be rough due to the high amount of rock fragments.

TIMBER Steep slopes, solar insolation, brush competition and high rock fragment contents in the soil limits forest regeneration. Burning when soil surface layers are dry can reduce productivity. Burning only when surface layers are moist can help maintain soil productivity.

Map Unit 491 Typic Udivitrands, mountain ridges

MAP UNIT SUMMARY

This map unit contains mid-elevation mountain ridges, on northerly to level aspects, which are underlain by highly fractured, hard metasedimentary rocks. Soils form in volcanic ash influenced loess overlying very gravelly or cobbly material derived from the underlying bedrock. Vegetation is mixed coniferous forest. Delineations mainly occur from the St. Joe to southern Priest.

MAP UNIT PROPERTIES

LANDFORM: This map unit occurs on mountain ridges at elevations of 3400 to 5000 feet. Slopes are on northerly aspects or on level ground, with slope gradients ranging from 0 to 40 percent. Dominant slope gradients are 10 to 35 percent.

GEOLOGY: The bedrock is weakly weathered quartzite, siltite and argillite from Precambrian Belt formations. Found in smaller amounts are quartz diorite, metadiabase and gabbro associated with sills. Intrusion of the Kaniksu Batholith into the Belt rocks produced thin zones of contact metamorphism and a variety of altered rocks which occur as inclusions.

Bedrock is hard and the upper layers are usually fractured and highly permeable to water.

VEGETATION: Undisturbed vegetation is a mixed coniferous forest. This map unit is a complex of habitat types. The major habitat types are western red cedar and western hemlock/queen cup beadlily (THPL/CLUN and TSHE/CLUN) and western redcedar and western hemlock/wild ginger (THPL/ASCA and TSHE/ASCA). These habitat types make up about 80 percent of the map unit.

Included are up to 20 percent dissimilar habitat types. Grand fir/beargrass, blue huckleberry and queencup beadlily (ABGR/XETE, ABGR/VAGL and ABGR/CLUN) occur on drier sites and are less productive. Western red cedar/oak-fern (THPL/GYDR) occurs in moist depressions and is more productive.

SOILS

Distribution: The dominant soil has a silt loam surface layer 14 to 22 inches thick derived from volcanic ash influenced loess. Subsoils contain 10 to 55 percent rock fragments. The dominant soil is a Typic Udivitrands, medial over loamy-skeletal, mixed, frigid. Similar soils have surface ash layers 7 to 14 inches thick and are Andic Dystrochrepts, loamy-skeletal, mixed, frigid. These soils occupy about 90 percent of the map unit.

Included are up to 10 percent dissimilar soils. Soils near moist draws and seeps tend to be more productive and are Humic Udivitrands, medial over loamy-skeletal, mixed, frigid.

Representative Profile: The major soils have a silt loam surface layer about 16 inches thick. The upper 3 inches are dark brown, silt loam and the lower 13 inches are dark yellowish brown, silt loam. Subsoils are dark yellowish brown, very gravelly sandy loams and loams about 24 inches thick. A yellowish

brown, extremely gravelly sandy loam substratum overlies fractured bedrock at depths greater than 5 feet.

MAP UNIT MANAGEMENT INTERPRETATIONS

WATERSHED: No special watershed protection measures are required for management practices commonly applied to this map unit.

ROADS: No special road construction practices are required in this map unit. Brush tends to encroach on roads.

TIMBER: The terrain is well suited to tractor operation. Timber management practices which compact, mix or displace the surface few inches of volcanic ash can reduce site productivity. Rock fragments make tree planting difficult in some areas.

Map Unit 493 Typic Udivitrands, mountain ridges, dry

MAP UNIT SUMMARY

This map unit contains mid-elevation mountain ridges, on southerly aspects, which are underlain by hard metasedimentary rocks. Soils form in volcanic ash influenced loess overlying very cobbly material derived from the underlying bedrock. Vegetation is mixed coniferous forest. Delineations mainly occur from the St. Joe to the southern Kaniksu.

MAP UNIT PROPERTIES

LANDFORM: This map unit occurs on mountain ridges at elevations of 3200 to 5000 feet. Slopes are on southerly aspects with gradients ranging from 0 to 40 percent but are dominantly 10 to 35 percent.

GEOLOGY: The bedrock is weakly weathered quartzite, siltite and argillite from Precambrian Belt formations. Found in smaller amounts are quartz diorite, metadiabase and gabbro associated with sills. Intrusion of the Kaniksu Batholith into the Belt rocks produced thin zones of contact metamorphism and a variety of altered rocks which occur as inclusions.

Bedrock is hard and the upper layers are usually fractured and highly permeable to water.

VEGETATION: Undisturbed vegetation is a mixed coniferous forest. This map unit is a complex of habitat types. The major habitat types are grand fir/beargrass and queen cup beadlily (ABGR/XETE and ABGR/CLUN). Included similar habitat types are grand fir/twinflower and blue huckleberry (ABGR/LIBO and ABGR/VAGL). These habitat types make up about 85 percent of the map unit.

Included are up to 15 percent dissimilar habitat types. Grand fir/wild ginger (ABGR/ASCA) and western red cedar/queencup beadlily (THPL/CLUN) occur on the more moist sites. They are more productive. Grand fir/ninebark (ABGR/PHMA) occurs on dry, rocky sites and is less productive.

SOILS

Distribution: The dominant soil has a silt loam surface layer 14 to 22 inches thick derived from volcanic ash influenced loess. Subsoils contain 10 to 55 percent rock fragments. The dominant soil is a Typic Udivitrands, medial over loamy-skeletal, mixed, frigid. Similar soils have surface ash layers 7 to 14 inches thick and are Andic Dystrachrepts, loamy-skeletal, mixed, frigid. These soils occupy about 90 percent of the map unit.

Included are up to 10 percent dissimilar soils. Soils near moist draws and seeps tend to be more productive and are Humic Udivitrands, medial over loamy-skeletal, mixed, frigid.

Representative Profile: The major soils have a silt loam surface layer about 16 inches thick. The upper 3 inches are dark brown, silt loam and the lower 13 inches are dark yellowish brown, silt loam. Subsoils are dark yellowish

brown, very gravelly sandy loams and loams about 24 inches thick. A yellowish brown, extremely gravelly sandy loam substratum overlies fractured bedrock at depths greater than 5 feet.

MAP UNIT MANAGEMENT INTERPRETATIONS

WATERSHED: No special watershed protection measures are required for management practices commonly applied to this map unit.

ROADS: No special road construction practices are required in this map unit.

TIMBER: The terrain is well suited to tractor operation. Timber management practices which compact, mix or displace the surface few inches of volcanic ash can reduce site productivity. Rock fragments make tree planting difficult in some areas. Burning when soil surface layers are dry can reduce productivity. Burning only when surface layers are moist can help maintain soil productivity.