

**125 Holland-Marpa families, deep complex, 40 to 60 percent slopes**

<b>Map Unit Components</b>	<b>Holland family, deep (55%)</b>	<b>Marpa family, deep (25%)</b>
<b>Geomorphic Position</b>	Steep, dissected mountain sideslopes.	Steep, dissected mountain sideslopes.
<b>Typical Vegetation Series</b>	Douglas-fir-Pine Mixed Conifer Forest, Mixed Conifer Black Oak Forest	Douglas-fir-Pine Mixed Conifer Forest, Mixed Conifer Black Oak Forest

**Soil Profile Description**

<b>Surface Soil</b>	0-3" brown gravelly loam, strong medium granular structure, 20% gravel and cobbles, neutral.	0-6" very pale brown gravelly loam, moderate medium granular structure, 27% gravel, slightly acid.
<b>Subsoil</b>	3-46" light brown to reddish yellow gravelly clay loam and cobbly clay loam, moderate medium and coarse subangular blocky structure 15 to 20% gravel and cobbles, slightly acid.	6-72" light yellowish brown to yellow very gravelly clay loam, moderate fine and medium subangular blocky structure, 15 to 20% gravel and cobbles, slightly acid.
<b>Substratum</b>	46-50" reddish yellow extremely cobbly clay loam, strong medium subangular blocky structure, 65% gravel and cobbles, slightly acid.	Metamorphic rock at greater than 40" depth.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	3-4	4
<b>Adapted Species Group</b>	DF, PP, SP	DF, PP, SP
<b>Soil Erodibility</b>	Moderate	Low
<b>AWC for Profile Depth</b>	6.0-9.7	5.7-8.5
<b>AWC for Surface 24"</b>	2.0-5.0	2.3-3.0
<b>Seedling Survival Potential</b>	High	Moderate-High
<b>Plantability Potential</b>	High	Moderate-High
<b>Hydrologic Soil Group</b>	B	B
<b>Potential for Roadbed Damage</b>	High	Moderate
<b>Inclusions (20%)</b>	Holland family Neuns, deep Neuns family Marpa family	

Remarks:

**126 Holland, deep-Neuns families complex, 20 to 40 percent slopes**

<b>Map Unit Components</b>	<b>Holland family, deep (55%)</b>	<b>Neuns family (30%)</b>
<b>Geomorphic Position</b>	Moderately steep, linear to broken mountain sideslopes including benches and toe slopes.	Moderately steep, linear mountain sideslopes.
<b>Typical Vegetation Series</b>	Douglas-fir-Pine Mixed Conifer Forest	Douglas-fir-Pine Mixed Conifer Forest

**Soil Profile Description**

<b>Surface Soil</b>	0-3" brown gravelly loam, strong medium granular structure, 20% gravel and cobbles, neutral.	0-11" brown to light brown very gravelly sandy loam, weak to moderate medium granular structure, 35-45% gravel, slightly acid.
<b>Subsoil</b>	3-46" light brown to reddish yellow gravelly clay loam and cobbly clay loam, moderate medium and coarse subangular blocky structure 15 to 20% gravel and cobbles, slightly acid.	11-23" light brown very gravelly sandy loam, moderate fine subangular blocky structure, 55% gravel and cobbles, slightly acid.
<b>Substratum</b>	46-50" reddish yellow extremely cobbly clay loam, strong medium subangular blocky structure, 65% gravel and cobbles, slightly acid.	23-34" highly fractured, slightly weathered metamorphic rock.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	3-4	5
<b>Adapted Species Group</b>	DF, PP, SP	DF, PP, SP
<b>Soil Erodibility</b>	Moderate	Low
<b>AWC for Profile Depth</b>	6.0-9.7	2.3-4.8
<b>AWC for Surface 24"</b>	2.0-5.0	1.6-3.2
<b>Seedling Survival Potential</b>	Moderate-High	Low-High
<b>Plantability Potential</b>	High	Moderate
<b>Hydrologic Soil Group</b>	B	B
<b>Potential for Roadbed Damage</b>	High	Moderate
<b>Inclusions (20%)</b>	Neuns family, deep Holland family Marpa family	

**Remarks:**

**127 Holland, deep-Neuns families complex, 40 to 60 percent slopes**

<b>Map Unit Components</b>	<b>Holland family, deep (50%)</b>	<b>Neuns family (30%)</b>
<b>Geomorphic Position</b>	Steep, dissected broken mountain sideslopes.	Steep to very steep, dissected linear to broken mountain sideslopes.
<b>Typical Vegetation Series</b>	Douglas-fir-Pine Mixed Conifer Forest	Douglas-fir-Pine Mixed Conifer Forest

**Soil Profile Description**

<b>Surface Soil</b>	0-3" brown gravelly loam, strong medium granular structure, 20% gravel and cobbles, neutral.	0-11" brown to light brown very gravelly sandy loam, weak to moderate medium granular structure, 35-45% gravel, slightly acid.
<b>Subsoil</b>	3-46" light brown to reddish yellow gravelly clay loam and cobbly clay loam, moderate medium and coarse subangular blocky structure 15 to 20% gravel and cobbles, slightly acid.	11-23" light brown very gravelly sandy loam, moderate fine subangular blocky structure, 55% gravel and cobbles, slightly acid.
<b>Substratum</b>	46-50" reddish yellow extremely cobbly clay loam, strong medium subangular blocky structure, 65% gravel and cobbles, slightly acid.	23-34" highly fractured, slightly weathered metamorphic rock.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	3-4	5
<b>Adapted Species Group</b>	DF, PP, SP	DF, PP, SP
<b>Soil Erodibility</b>	Moderate	Low
<b>AWC for Profile Depth</b>	6.0-9.7	2.3-4.8
<b>AWC for Surface 24"</b>	2.0-5.0	1.6-3.2
<b>Seedling Survival Potential</b>	Moderate-High	Low-High
<b>Plantability Potential</b>	Moderate-High	Moderate-High
<b>Hydrologic Soil Group</b>	B	B
<b>Potential for Roadbed Damage</b>	High	Moderate
<b>Inclusions (20%)</b>	Neuns family, deep Holland family Marpa family	

**Remarks:**

**128 Holland, deep-Neuns families complex, 20 to 40 percent slopes**

<b>Map Unit Components</b>	<b>Holland family, deep (60%)</b>	<b>Neuns family, deep (30%)</b>
<b>Geomorphic Position</b>	Broken mountain sideslopes, benches, and toe slopes.	Moderately steep, linear mountain sideslopes.
<b>Typical Vegetation Series</b>	Douglas-fir-Pine Mixed Conifer Sierran-Cascade Mixed Conifer Forest	Douglas-fir-Pine Mixed Conifer Forest, Sierran_Cascade Mixed Conifer Forest

**Soil Profile Description**

<b>Surface Soil</b>	0-3" brown gravelly loam, strong medium granular structure, 20% gravel and cobbles, neutral.	0-9" brown gravelly loam and very gravelly loam, moderate fine and very fine granular structure, 30-50% gravel and cobbles, neutral to slightly acid.
<b>Subsoil</b>	3-46" light brown to reddish yellow gravelly clay loam and cobbly clay loam, moderate medium and coarse subangular blocky structure 15 to 20% gravel and cobbles, slightly acid.	9-61" light yellowish brown very gravelly loam to pale yellow very cobbly light clay loam, massive 50-55% gravel and cobbles, slightly to medium acid.
<b>Substratum</b>	46-50" reddish yellow extremely cobbly clay loam, strong medium subangular blocky structure, 65% gravel and cobbles, slightly acid.	

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	3-4	4-5
<b>Adapted Species Group</b>	DF, PP, SP	DF, PP, SP
<b>Soil Erodibility</b>	Moderate	Moderate
<b>AWC for Profile Depth</b>	6.0-9.7	2.7-5.7
<b>AWC for Surface 24"</b>	2.0-5.0	2.0-3.0
<b>Seedling Survival Potential</b>	Moderate-High	Moderate-High
<b>Plantability Potential</b>	High	High
<b>Hydrologic Soil Group</b>	B	B
<b>Potential for Roadbed Damage</b>	High	Moderate
<b>Inclusions (10%)</b>	Marpa family, deep	

Remarks:

**129 Holland family, granitic, 20 to 50 percent slopes**

Map Unit Components	<b>Holland family, granitic (75%)</b>
Geomorphic Position	Moderately steep to steep mountain sideslopes.
Typical Vegetation Series	Douglas-fir-Pine Mixed Conifer Forest Upper Montane Mixed Chaparral

**Soil Profile Description**

Surface Soil	0-15" light yellowish brown sandy loam and heavy coarse sandy loam, moderate fine and medium granular structure, to massive, 10 to 14% gravel and cobbles, medium acid.
Subsoil	15-28" yellow gravelly sandy clay loam, massive, 17% gravel and cobbles, medium acid.
Substratum	28-35" decomposed granitic rock, highly weathered. 35-45" slightly weathered diorite bedrock.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	4-5
Adapted Species Group	DF, PP, SP
Soil Erodibility	High
AWC for Profile Depth	3.8-5.0
AWC for Surface 24"	2.4-3.0
Seedling Survival Potential	Moderate
Plantability Potential	Moderate
Hydrologic Soil Group	B
Potential for Roadbed Damage	V. High
Inclusions (25%)	Chaix family Hugo family Chawanakee family Holland family, deep

Remarks:

**130 Holland, granitic-Neuns families complex, 20 to 40 percent slopes**

<b>Map Unit Components</b>	<b>Holland family, granitic (60%)</b>	<b>Neuns family (30%)</b>
<b>Geomorphic Position</b>	Moderately steep mountain sideslopes.	Moderately steep mountain sideslopes.
<b>Typical Vegetation Series</b>	Douglas-fir-Pine Mixed Conifer Forest	Douglas-fir-Pine Mixed Conifer Forest

**Soil Profile Description**

<b>Surface Soil</b>	0-15" light yellowish brown sandy loam and heavy coarse sandy loam, moderate fine and medium granular structure, to massive, 10 to 14% gravel and cobbles, medium acid.	0-11" brown to light brown very gravelly sandy loam, weak to moderate medium granular structure, 35-45% gravel, slightly acid.
<b>Subsoil</b>	15-28" yellow gravelly sandy clay loam, massive, 17% gravel and cobbles, medium acid.	11-23" light brown very gravelly sandy loam, moderate fine subangular blocky structure, 55% gravel and cobbles, slightly acid.
<b>Substratum</b>	28-35" decomposed granitic rock, highly weathered. 35-45" slightly weathered diorite bedrock.	23-34" highly fractured, slightly weathered metamorphic rock.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	4-5	5
<b>Adapted Species Group</b>	DF, PP, SP	DF, PP, SP
<b>Soil Erodibility</b>	High	Low
<b>AWC for Profile Depth</b>	3.8-5.0	2.3-4.8
<b>AWC for Surface 24"</b>	2.4-3.0	1.6-3.2
<b>Seedling Survival Potential</b>	Moderate	Low-High
<b>Plantability Potential</b>	High	High
<b>Hydrologic Soil Group</b>	B	B
<b>Potential for Roadbed Damage</b>	V. High	Moderate
<b>Inclusions (10%)</b>	Chaix family Chawanakee family Hugo family	

**Remarks:**

**131 Hugo family, 15 to 40 percent slopes**

<b>Map Unit Components</b>	<b>Hugo family (75%)</b>
<b>Geomorphic Position</b>	Moderately steep linear to broken undulating sideslopes.
<b>Typical Vegetation Series</b>	Douglas-fir-Pine Mixed Conifer Forest, Sierran-Cascade Mixed Conifer Forest

**Soil Profile Description**

<b>Surface Soil</b>	0-4" brown loam. weak very fine granular structure, 10% gravel, medium acid.
<b>Subsoil</b>	4-50" light yellowish brown loam to pale brown gravelly sandy clay loam, weak to moderate fine subangular blocky structure, 10-30% gravel, medium to strongly acid.
<b>Substratum</b>	50-68" highly fractured, slightly to moderately weathered metasediments.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	3-4
<b>Adapted Species Group</b>	WF, PP, SP, DF
<b>Soil Erodibility</b>	Moderate
<b>AWC for Profile Depth</b>	4.8-7.1
<b>AWC for Surface 24"</b>	3.1-3.9
<b>Seedling Survival Potential</b>	High
<b>Plantability Potential</b>	Moderate-High
<b>Hydrologic Soil Group</b>	B
<b>Potential for Roadbed Damage</b>	High
<b>Inclusions (25%)</b>	Neuns family, deep Holland family, deep Hohmann family

**Remarks:**

**132 Hugo family, 40 to 60 percent slopes**

Map Unit Components	<b>Hugo family (75%)</b>
Geomorphic Position	Steep dissected mountain sideslopes.
Typical Vegetation Series	Douglas-fir-Pine Mixed Conifer Forest, Upper Montane Mixed Chaparral

**Soil Profile Description**

Surface Soil	0-4" brown loam. weak very fine granular structure, 10% gravel, medium acid.
Subsoil	4-50" light yellowish brown loam to pale brown gravelly sandy clay loam, weak to moderate fine subangular blocky structure, 10-30% gravel, medium to strongly acid.
Substratum	50-68" highly fractured, slightly to moderately weathered metasediments.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	3-4
Adapted Species Group	WF, PP, SP, DF
Soil Erodibility	Moderate
AWC for Profile Depth	4.0-7.5
AWC for Surface 24"	2.4-4.1
Seedling Survival Potential	Moderate-High
Plantability Potential	High
Hydrologic Soil Group	B
Potential for Roadbed Damage	High
Inclusions (25%)	Neuns family Hugo family, moderately deep Neuns family, deep
Remarks:	

**133 Hugo family, 60 to 80 percent slopes**

Map Unit Components	<b>Hugo family (75%)</b>
Geomorphic Position	Very steep mountain sideslopes.
Typical Vegetation Series	Douglas-fir-Pine Mixed Conifer Forest, Mixed Conifer-Fir Forest

**Soil Profile Description**

Surface Soil	0-4" brown loam. weak very fine granular structure, 10% gravel, medium acid.
Subsoil	4-50" light yellowish brown loam to pale brown gravelly sandy clay loam, weak to moderate fine subangular blocky structure, 10-30% gravel, medium to strongly acid.
Substratum	50-68" highly fractured, slightly to moderately weathered metasediments.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	3-4
Adapted Species Group	DF, PP, SP
Soil Erodibility	Moderate
AWC for Profile Depth	4.0-7.5
AWC for Surface 24"	2.4-4.1
Seedling Survival Potential	Moderate-High
Plantability Potential	High
Hydrologic Soil Group	B
Potential for Roadbed Damage	High
Inclusions (25%)	Neuns family Hugo family, moderately deep Marpa family, deep Neuns family, deep Deadwood family

Remarks:

**134 Hugo-Chaix families complex, 40 to 60 percent slopes**

**Map Unit Components**

**Hugo family (60%)**

**Chaix family (30%)**

**Geomorphic Position**

Steep dissected mountain sideslopes.

Steep dissected mountain sideslopes.

**Typical Vegetation Series**

Douglas-fir-Pine Mixed Conifer Forest,  
Upper Montane Mixed Chaparral

Douglas-fir-Pine Mixed Conifer Forest, Upper  
Montane Mixed Chaparral

**Soil Profile Description**

**Surface Soil**

0-4" brown loam. weak very fine granular structure, 10% gravel, medium acid.

0-10" dark grayish brown and light brownish gray coarse sandy loam, strong medium and weak coarse granular structure, 5-13% gravel

**Subsoil**

4-50" light yellowish brown loam to pale brown gravelly sandy clay loam, weak to moderate fine subangular blocky structure, 10-30% gravel, medium to strongly acid.

10-18" very pale brown cobbly coarse sandy loam, massive, 20% gravel and cobbles, medium acid.

**Substratum**

50-68" highly fractured, slightly to moderately weathered metasediments.

18-29" grayish brown gravelly loamy coarse sand, massive, 23% gravel and cobbles, medium acid.  
29-32" weathered granitic rock.

**Soil Properties & Management Interpretations**

**Forest Survey Site Class**

3-4

5

**Adapted Species Group**

WF, PP, SP, DF

DF, PP, SP

**Soil Erodibility**

Moderate

Moderate

**AWC for Profile Depth**

4.8-7.1

2.0-3.2

**AWC for Surface 24"**

3.1-3.9

1.6-2.5

**Seedling Survival Potential**

High

Moderate

**Plantability Potential**

High

High

**Hydrologic Soil Group**

B

B

**Potential for Roadbed Damage**

High

V. High

**Inclusions (10%)**

Ovall family  
Neuns family  
Chawanakee family

**Remarks:**

**135 Hugo-Chaix families complex, 60 to 80 percent slopes**

<b>Map Unit Components</b>	<b>Hugo family (60%)</b>	<b>Chaix family (30%)</b>
<b>Geomorphic Position</b>	Very steep dissected mountain sideslopes.	Very steep dissected mountain sideslopes.
<b>Typical Vegetation Series</b>	Douglas-fir-Pine Mixed Conifer Forest, Upper Montane Mixed Chaparral	Douglas-fir-Pine Mixed Conifer Forest, Upper Montane Mixed Chaparral

**Soil Profile Description**

<b>Surface Soil</b>	0-4" brown loam. weak very fine granular structure, 10% gravel, medium acid.	0-10" dark grayish brown and light brownish gray coarse sandy loam, strong medium and weak coarse granular structure, 5-13% gravel
<b>Subsoil</b>	4-50" light yellowish brown loam to pale brown gravelly sandy clay loam, weak to moderate fine subangular blocky structure, 10-30% gravel, medium to strongly acid.	10-18" very pale brown cobbly coarse sandy loam, massive, 20% gravel and cobbles, medium acid.
<b>Substratum</b>	50-68" highly fractured, slightly to moderately weathered metasediments.	18-29" grayish brown gravelly loamy coarse sand, massive, 23% gravel and cobbles, medium acid. 29-32" weathered granitic rock.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	3-4	5
<b>Adapted Species Group</b>	WF, PP, SP, DF	DF, PP, SP
<b>Soil Erodibility</b>	Moderate	Moderate
<b>AWC for Profile Depth</b>	4.8-7.1	2.0-3.2
<b>AWC for Surface 24"</b>	3.1-3.9	1.6-2.5
<b>Seedling Survival Potential</b>	High	Low-Moderate
<b>Plantability Potential</b>	High	High
<b>Hydrologic Soil Group</b>	B	B
<b>Potential for Roadbed Damage</b>	High	V. High
<b>Inclusions (10%)</b>	Chawanakee family Neuns family Ovall family	

**Remarks:**

**136 Hugo-Holland, deep families complex, 20 to 40 percent slopes**

Map Unit Components	<b>Hugo family (60%)</b>	<b>Holland family, deep (30%)</b>
Geomorphic Position	Broken moderately steep mountain sideslopes.	Broken moderately steep mountain sideslopes and toe slopes.
Typical Vegetation Series	Douglas-fir-Pine Mixed Conifer Forest, Mixed Conifer-Fir Forest	Douglas-fir-Pine Mixed Conifer Forest, Mixed Conifer-Fir Forest

**Soil Profile Description**

Surface Soil	0-4" brown loam. weak very fine granular structure, 10% gravel, medium acid.	0-3" brown gravelly loam, strong medium granular structure, 20% gravel and cobbles, neutral.
Subsoil	4-50" light yellowish brown loam to pale brown gravelly sandy clay loam, weak to moderate fine subangular blocky structure, 10-30% gravel, medium to strongly acid.	3-46" light brown to reddish yellow gravelly clay loam and cobbly clay loam, moderate medium and coarse subangular blocky structure 15 to 20% gravel and cobbles, slightly acid.
Substratum	50-68" highly fractured, slightly to moderately weathered metasediments.	46-50" reddish yellow extremely cobbly clay loam, strong medium subangular blocky structure, 65% gravel and cobbles, slightly acid.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	3-4	3-4
Adapted Species Group	DF, PP, SP	DF, PP, SP
Soil Erodibility	Moderate	Moderate
AWC for Profile Depth	4.0-7.5	6.0-9.7
AWC for Surface 24"	2.4-4.1	2.0-5.0
Seedling Survival Potential	Moderate-High	Low-Moderate
Plantability Potential	High	High
Hydrologic Soil Group	B	B
Potential for Roadbed Damage	High	High
Inclusions (10%)	Neuns family Holland family Neuns family, deep Marpa family, deep Forbes family	

Remarks:

**137 Hugo-Neuns families complex, 20 to 40 percent slopes**

Map Unit Components

**Hugo family (50%)**

**Neuns family (30%)**

Geomorphic Position

Moderately steep, mountain sideslopes.

Moderately steep, mountain sideslopes.

Typical Vegetation Series

Douglas-fir-Pine Mixed Conifer Forest,  
Mixed Conifer-Fir Forest

Douglas-fir-Pine Mixed Conifer Forest, Mixed  
Conifer-Fir Forest

**Soil Profile Description**

Surface Soil

0-4" brown loam. weak very fine granular structure, 10% gravel, medium acid.

0-11" brown to light brown very gravelly sandy loam, weak to moderate medium granular structure, 35-45% gravel, slightly acid.

Subsoil

4-50" light yellowish brown loam to pale brown gravelly sandy clay loam, weak to moderate fine subangular blocky structure, 10-30% gravel, medium to strongly acid.

11-23" light brown very gravelly sandy loam, moderate fine subangular blocky structure, 55% gravel and cobbles, slightly acid.

Substratum

50-68" highly fractured, slightly to moderately weathered metasediments.

23-34" highly fractured, slightly weathered metamorphic rock.

**Soil Properties & Management Interpretations**

Forest Survey Site Class

3-4

5

Adapted Species Group

DF, PP, SP

DF, PP, SP

Soil Erodibility

Moderate

Low

AWC for Profile Depth

4.0-7.5

2.3-4.8

AWC for Surface 24"

2.4-4.1

1.6-3.2

Seedling Survival Potential

Moderate-High

Low-Moderate

Plantability Potential

High

High

Hydrologic Soil Group

B

B

Potential for Roadbed Damage

High

Moderate

Inclusions (20%)

Neuns family, deep  
Hugo family, moderately deep

Remarks:

**138 Hugo-Neuns families complex, 40 to 60 percent slopes**

Map Unit Components	Hugo family (50%)	Neuns family (25%)
Geomorphic Position	Dissected, steep, broken mountain sideslopes.	Moderately dissected, steep, broken mountain sideslopes.
Typical Vegetation Series	Douglas-fir-Pine Mixed Conifer Forest, Mixed Conifer-Fir Forest	Douglas-fir-Pine Mixed Conifer Forest, Mixed Conifer-Fir Forest

**Soil Profile Description**

Surface Soil	0-4" brown loam. weak very fine granular structure, 10% gravel, medium acid.	0-11" brown to light brown very gravelly sandy loam, weak to moderate medium granular structure, 35-45% gravel, slightly acid.
Subsoil	4-50" light yellowish brown loam to pale brown gravelly sandy clay loam, weak to moderate fine subangular blocky structure, 10-30% gravel, medium to strongly acid.	11-23" light brown very gravelly sandy loam, moderate fine subangular blocky structure, 55% gravel and cobbles, slightly acid.
Substratum	50-68" highly fractured, slightly to moderately weathered metasediments.	23-34" highly fractured, slightly weathered metamorphic rock.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	3-4	5
Adapted Species Group	DF, PP, SP	DF, PP, SP
Soil Erodibility	Moderate	Low
AWC for Profile Depth	4.0-7.5	2.3-4.8
AWC for Surface 24"	2.4-4.1	1.6-3.2
Seedling Survival Potential	Moderate-High	Low-Moderate
Plantability Potential	High	Moderate
Hydrologic Soil Group	B	B
Potential for Roadbed Damage	High	Moderate
Inclusions (25%)	Neuns family, deep Hugo family, moderately deep Deadwood family Marpa soils	

Remarks:

**139 Hugo-Neuns families complex, 60 to 80 percent slopes**

Map Unit Components

**Hugo family (50%)**

**Neuns family (30%)**

Geomorphic Position

Very steep mountain sideslopes.

Very steep mountain sideslopes.

Typical Vegetation Series

Douglas-fir-Pine Mixed Conifer Forest,  
Mixed Conifer-Fir Forest

Douglas-fir-Pine Mixed Conifer Forest, Mixed  
Conifer-Fir Forest

**Soil Profile Description**

Surface Soil

0-4" brown loam. weak very fine granular structure, 10% gravel, medium acid.

0-11" brown to light brown very gravelly sandy loam, weak to moderate medium granular structure, 35-45% gravel, slightly acid.

Subsoil

4-50" light yellowish brown loam to pale brown gravelly sandy clay loam, weak to moderate fine subangular blocky structure, 10-30% gravel, medium to strongly acid.

11-23" light brown very gravelly sandy loam, moderate fine subangular blocky structure, 55% gravel and cobbles, slightly acid.

Substratum

50-68" highly fractured, slightly to moderately weathered metasediments.

23-34" highly fractured, slightly weathered metamorphic rock.

**Soil Properties & Management Interpretations**

Forest Survey Site Class

3-4

5

Adapted Species Group

DF, PP, SP

DF, PP, SP

Soil Erodibility

Moderate

Low

AWC for Profile Depth

4.0-7.5

2.3-4.8

AWC for Surface 24"

2.4-4.1

1.6-3.2

Seedling Survival Potential

Moderate-High

Low-Moderate

Plantability Potential

Moderate

Moderate

Hydrologic Soil Group

B

B

Potential for Roadbed  
Damage

High

Moderate

Inclusions (20%)

Deadwood family  
Rubble land  
Hugo family, moderately deep  
Neuns family, deep

Remarks:

**140 Hugo family, moderately deep, 40 to 60 percent slopes**

Map Unit Components	<b>Hugo family, moderately deep (75%)</b>
Geomorphic Position	Steep, dissected mountain sideslopes.
Typical Vegetation Series	Douglas-fir-Pine Mixed Conifer Forest

**Soil Profile Description**

Surface Soil	0-10" light brownish gray very gravelly heavy loam, and gravelly heavy loam, moderate and strong fine angular blocky structure, 50-33% gravel, slightly to medium acid.
Subsoil	10-27" light yellowish brown gravelly silty clay loam, strong medium angular blocky structure, 30% gravel, strongly acid.
Substratum	27-34" light yellowish brown gravelly clay loam, weak medium and coarse angular blocky structure, 33% gravel, very strong acid. 34-40" slightly weathered shale.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	5
Adapted Species Group	DF, PP, SP
Soil Erodibility	High
AWC for Profile Depth	2.5-5.3
AWC for Surface 24"	2.3-3.5
Seedling Survival Potential	Moderate-High
Plantability Potential	High
Hydrologic Soil Group	C
Potential for Roadbed Damage	Moderate
Inclusions (25%)	Neuns family Marpa family Hugo family

Remarks:

**141 Hugo, moderately deep-Holland families complex, 40 to 60 percent slopes**

<b>Map Unit Components</b>	<b>Hugo family, moderately deep (50%)</b>	<b>Holland family (30%)</b>
<b>Geomorphic Position</b>	Steep, dissected mountain sideslopes.	Steep, dissected mountain sideslopes.
<b>Typical Vegetation Series</b>	Douglas-fir-Pine Mixed Conifer Forest	Douglas-fir-Pine Mixed Conifer Forest

**Soil Profile Description**

<b>Surface Soil</b>	0-10" light brownish gray very gravelly heavy loam, and gravelly heavy loam, moderate and strong fine angular blocky structure, 50-33% gravel, slightly to medium acid.	0-3" brown gravelly loam, strong fine granular structure, 30% gravel, slightly acid.
<b>Subsoil</b>	10-27" light yellowish brown gravelly silty clay loam, strong medium angular blocky structure, 30% gravel, strongly acid.	3-18" light brown gravelly loam and gravelly clay loam, weak fine and moderate medium subangular blocky structure, 20 to 30% gravel, slightly to medium acid. 18-26" reddish yellow extremely gravelly sandy clay loam, moderate very fine subangular blocky structure, 70% gravel and cobbles, medium acid.
<b>Substratum</b>	27-34" light yellowish brown gravelly clay loam, weak medium and coarse angular blocky structure, 33% gravel, very strong acid. 34-40" slightly weathered shale.	26-30" highly fractured, moderately weathered metavolcanic rock.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	5	3-4
<b>Adapted Species Group</b>	DF, PP, SP	DF, PP, SP
<b>Soil Erodibility</b>	High (21)	Moderate (15)
<b>AWC for Profile Depth</b>	2.5-5.3	4.0-7.5
<b>AWC for Surface 24"</b>	2.3-3.5	2.4-4.1
<b>Seedling Survival Potential</b>	Moderate-High	Moderate-High
<b>Plantability Potential</b>	High	High
<b>Hydrologic Soil Group</b>	C	B
<b>Potential for Roadbed Damage</b>	Moderate	High
<b>Inclusions (20%)</b>	Neuns family Marpa family Hugo family	

**Remarks:**

**142 Hugo, moderately deep-Holland, deep families complex, 20 to 40 percent slopes**

Map Unit Components	<b>Hugo family, moderately deep (60%)</b>	<b>Holland family, deep (30%)</b>
Geomorphic Position	Moderately steep, mountain sideslopes.	Moderately steep, dissected mountain sideslopes.
Typical Vegetation Series	Douglas-fir Forest	Douglas-fir-Pine Mixed Conifer Forest

**Soil Profile Description**

Surface Soil	0-10" light brownish gray very gravelly heavy loam, and gravelly heavy loam, moderate and strong fine angular blocky structure, 50-33% gravel, slightly to medium acid.	0-3" brown gravelly loam, strong medium granular structure, 20% gravel and cobbles, neutral.
Subsoil	10-27" light yellowish brown gravelly silty clay loam, strong medium angular blocky structure, 30% gravel, strongly acid.	3-46" light brown to reddish yellow gravelly clay loam and cobbly clay loam, moderate medium and coarse subangular blocky structure, 15 to 20% gravel and cobbles, slightly acid.
Substratum	27-34" light yellowish brown gravelly clay loam, weak medium and coarse angular blocky structure, 33% gravel, very strong acid. 34-40" slightly weathered shale.	46-50" reddish yellow extremely cobbly clay loam, strong medium subangular blocky structure, 65% gravel and cobbles, slightly acid.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	5	3-4
Adapted Species Group	DF, PP, SP	DF, PP, SP
Soil Erodibility	High	Moderate
AWC for Profile Depth	2.5-5.3	6.0-9.7
AWC for Surface 24"	2.3-3.5	2.0-5.0
Seedling Survival Potential	Moderate-High	Moderate-High
Plantability Potential	High	High
Hydrologic Soil Group	C	B
Potential for Roadbed Damage	Moderate	High
Inclusions (10%)	Hugo family Holland family Neuns family Neuns family, deep	

Remarks:

**143 Hugo, moderately deep-Neuns families complex, 60 to 80 percent slopes**

<b>Map Unit Components</b>	<b>Hugo family, moderately deep (60%)</b>	<b>Neuns family (30%)</b>
<b>Geomorphic Position</b>	Very steep, dissected mountain sideslopes.	Very steep, dissected mountain sideslopes.
<b>Typical Vegetation Series</b>	Douglas-fir-Pine Mixed Conifer Forest	Douglas-fir-Pine Mixed Conifer Forest

**Soil Profile Description**

<b>Surface Soil</b>	0-10" light brownish gray very gravelly heavy loam, and gravelly heavy loam, moderate and strong fine angular blocky structure, 50-33% gravel, slightly to medium acid.	0-11" brown to light brown very gravelly sandy loam, weak to moderate medium granular structure, 35-45% gravel, slightly acid.
<b>Subsoil</b>	10-27" light yellowish brown gravelly silty clay loam, strong medium angular blocky structure, 30% gravel, strongly acid.	11-23" light brown very gravelly sandy loam, moderate fine subangular blocky structure, 55% gravel and cobbles, slightly acid.
<b>Substratum</b>	27-34" light yellowish brown gravelly clay loam, weak medium and coarse angular blocky structure, 33% gravel, very strong acid. 34-40" slightly weathered shale.	23-34" highly fractured, slightly weathered metamorphic rock.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	5	5
<b>Adapted Species Group</b>	DF, PP, SP	DF, PP, SP
<b>Soil Erodibility</b>	High	Low
<b>AWC for Profile Depth</b>	2.5-5.3	2.3-4.8
<b>AWC for Surface 24"</b>	2.3-3.5	1.6-3.2
<b>Seedling Survival Potential</b>	Moderate-High	Low-High
<b>Plantability Potential</b>	High	Moderate-High
<b>Hydrologic Soil Group</b>	C	B
<b>Potential for Roadbed Damage</b>	Moderate	Moderate
<b>Inclusions (10%)</b>	Deadwood family Hugo family Neuns family, deep	

**Remarks:**

**144 Huntmount family, 40 to 60 percent slopes**

Map Unit Components	<b>Huntmount family (75%)</b>
Geomorphic Position	Steep, dissected mountain sideslopes.
Typical Vegetation Series	Sierran-Cascade Mixed Conifer Forest, Douglas-fir-Pine Mixed Conifer Forest

**Soil Profile Description**

Surface Soil	0-12" light yellowish brown gravelly loam, strong very fine to moderate medium subangular blocky structure, 15-25% gravel, slightly acid to neutral.
Subsoil	12-50" pink clay loam to light brown gravelly clay loam, strong medium and moderate fine subangular blocky structure, 10-30% gravel and cobbles, neutral.
Substratum	50-60" light brown gravelly heavy loam, relict rock structure, 30% gravel, neutral.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	3-5
Adapted Species Group	DF, PP, SP
Soil Erodibility	Moderate
AWC for Profile Depth	7.5-10.0
AWC for Surface 24"	3.3-3.9
Seedling Survival Potential	High
Plantability Potential	Moderate-High
Hydrologic Soil Group	B
Potential for Roadbed Damage	High
Inclusions (25%)	Neuns family, deep Marpa family, deep Hugo family Neuns family

Remarks:

**145 Huntmount-Hugo Marpa, deep families complex, 15 to 45 percent slope**

<b>Map Unit Components</b>	<b>Huntmount family (40%)</b>	<b>Hugo family (25%)</b>	<b>Marpa family, deep (20%)</b>
<b>Geomorphic Position</b>	Moderately steep, dissected, slopes and benches.	Similar position as Huntmount family.	Similar position as Huntmount family.
<b>Typical Vegetation Series</b>	Sierran-Cascade Mixed Conifer Forest, Douglas fir-Pine, Mixed Conifer Forest.	Similar vegetation as Huntmount family.	Similar vegetation as Huntmount family.

**Soil Profile Description**

<b>Surface Soil</b>	0-12" light yellowish brown gravelly loam, strong very fine to moderate medium subangular blocky structure, 15-25% gravel, slightly acid to neutral.	0-4" brown loam, weak very fine granular structure, 10% gravel, medium acid.	0-6" very pale brown gravelly loam, moderate medium granular structure, 27% gravel, slightly acid.
<b>Subsoil</b>	12-50" pink clay loam to light brown gravelly clay loam, strong medium and moderate fine subangular blocky structure, 10-30% gravel and cobbles, neutral.	4-50" light yellowish brown loam to pale brown gravelly sandy clay loam, weak to moderate fine subangular blocky structure, 10-30% gravel, medium to strongly acid.	6-72" light yellowish brown to yellow very gravelly clay loam, moderate fine and medium subangular blocky structure, 15 to 20% gravel and cobbles, slightly acid.
<b>Substratum</b>	50-60" light brown gravelly heavy loam, relict rock structure, 30% gravel,	50-68" highly fractured, slightly to moderately weathered metasediments.	Metamorphic rock at greater than 70" depth.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	3-5	3-4	4
<b>Adapted Species Group</b>	DF, PP, SP	WF, PP, SP, DF	DF, PP, SP
<b>Soil Erodibility</b>	Moderate	Moderate	Low
<b>AWC for Profile Depth</b>	7.5-10.0	4.8-7.1	5.7-8.5
<b>AWC for Surface 24"</b>	3.3-3.9	3.1-3.9	2.3-3.0
<b>Seedling Survival Potential</b>	High	High	Moderate-High
<b>Plantability Potential</b>	High-Moderate	High-Moderate	High-Moderate
<b>Hydrologic Soil Group</b>	B	B	B
<b>Potential for Roadbed Damage</b>	High	High	Moderate
<b>Inclusions (15%)</b>	Neuns family, deep Holland family, deep Neuns family		

**Remarks:**

**146 Inville-Jayar, deep families complex, 15 to 40 percent slopes**

<b>Map Unit Components</b>	<b>Inville family (55%)</b>	<b>Jayar family, deep (30%)</b>
<b>Geomorphic Position</b>	Moderately steep to steep, mountain sideslopes and ridge tops.	Steep, linear, smooth mountain sideslopes.
<b>Typical Vegetation Series</b>	Klamath Enriched Mixed Conifer Forest	Klamath Enriched Mixed Conifer Forest

**Soil Profile Description**

<b>Surface Soil</b>	0-15" light yellowish brown gravelly loam and reddish yellow very gravelly loam, moderate fine granular to moderate medium subangular blocky structure, 25-35% gravel and cobbles strongly to medium acid.	0-4" yellowish brown very gravelly sandy loam, strong fine and very fine granular structure, 40% gravel and cobbles, strongly acid.
<b>Subsoil</b>	15-44" brownish yellow very cobbly clay loam to light yellowish brown extremely cobbly clay loam, weak medium to moderate fine subangular blocky structure, 38-70% gravel and cobbles, medium to slightly acid.	4-20" yellowish brown very gravelly sandy loam, weak fine and very fine subangular blocky structure, 45-50% gravel and cobbles, medium acid.
<b>Substratum</b>	44+" unconsolidated glacial till from mafic igneous sources.	20-48" pale yellow extremely stony coarse sandy loam and light yellowish brown extremely stony loamy sand, single grain, 62-75% gravel and stones, slightly acid. 48-50" hard, compacted glacial till.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	4-5	5-6
<b>Adapted Species Group</b>	WF, JP, SP, DF	WF, JP, SP, DF
<b>Soil Erodibility</b>	Low	Low
<b>AWC for Profile Depth</b>	2.0-5.0	2.0-4.0
<b>AWC for Surface 24"</b>	1.4-2.5	2.0-3.2
<b>Seedling Survival Potential</b>	Low-Moderate	Moderate-High
<b>Plantability Potential</b>	High-Moderate	High-Moderate
<b>Hydrologic Soil Group</b>	B	B
<b>Potential for Roadbed Damage</b>	Moderate	Moderate
<b>Inclusions (15%)</b>	Wintoner family Skymor family Jayar family	

**Remarks:**

**147 Inville-Jayar families association, 20 to 50 percent slopes**

Map Unit Components  
Geomorphic Position

**Inville family (60%)**  
Moderately steep, linear, to broken ground moraines.

**Jayar family (30%)**  
Similar position as Inville family.

Typical Vegetation Series

Klamath Enriched Mixed Conifer Forest,  
White Fir Forest

Similar vegetation as Inville family

**Soil Profile Description**

Surface Soil

0-15" light yellowish brown gravelly loam and reddish yellow very gravelly loam, moderate fine granular to moderate medium subangular blocky structure, 25-35% gravel and cobbles strongly to medium acid.

0-5" light gray very gravelly sandy loam, moderate medium granular structure, 40% gravel and cobbles, medium acid.

Subsoil

15-44" brownish yellow very cobbly clay loam to light yellowish brown extremely cobbly clay loam, weak medium to moderate fine subangular blocky structure, 38-70% gravel and cobbles, medium to slightly acid.

5-26" light brownish gray very cobbly very fine sandy loam and light gray very cobbly loam, weak medium subangular blocky structure, 42-55% cobbles and gravel, strongly to slightly acid.

Substratum

44+" unconsolidated glacial till from mafic igneous sources.

26-36" moderately fractured unweathered basic intrusive rock.

**Soil Properties & Management Interpretations**

Forest Survey Site Class

4-5

4-5

Adapted Species Group

WF, JP, SP, DF

WF, JP, SP, DF

Soil Erodibility

Low

Low

AWC for Profile Depth

2.0-5.0

2.6-4.0

AWC for Surface 24"

1.4-2.5

1.2-2.0

Seedling Survival Potential

Low-Moderate

Low

Plantability Potential

High-Moderate

High-Moderate

Hydrologic Soil Group

B

A-B

Potential for Roadbed Damage

Moderate

Moderate

Inclusions (10%)

Jayar family  
Glacial till

Remarks:

**148 Ishi Pishi-Ishi Pishi family, deep complex, 35 to 70 percent slopes**

Map Unit Components	<b>Ishi Pishi family (60%)</b>	<b>Ishi Pishi family, deep (30%)</b>
Geomorphic Position	Dissected, steep to very steep, mountain sideslopes.	Dissected, steep to very steep, mountain sideslopes.
Typical Vegetation Series	Jeffrey Pine Mixed Conifer Forest, Sierran-Cascade Mixed Conifer Forest	Jeffrey Pine Mixed Conifer Forest, Sierran-Cascade Mixed Conifer Forest

**Soil Profile Description**

Surface Soil	0-7" reddish yellow gravelly loam and gravelly light clay loam, moderate medium granular structure, 20% gravel and cobbles, neutral.	0-3" brown heavy gravelly loam, weak fine granular structure, 30% gravel, neutral.
Subsoil	7-34" brown to strong brown gravelly clay loam to dark yellowish brown extremely gravelly or cobbly clay, moderate to strong fine subangular blocky structure, 30-80% gravel and cobbles, neutral.	3-48" yellowish red very gravelly heavy clay loam to heavy yellowish brown very cobbly clay, moderate to strong fine subangular blocky structure, 35-55% gravel and cobbles, slightly acid to neutral.
Substratum	34-42" fractured ultramafic.	48-52" fractured, moderately weathered ultramafic rock.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	5-6	4-5
Adapted Species Group	JP, IC, DF	JP, IC, DF, WWP
Soil Erodibility	Moderate	Moderate
AWC for Profile Depth	3.5-4.1	5.0-6.9
AWC for Surface 24"	1.8-3.0	2.0-3.8
Seedling Survival Potential	Low-Moderate	Moderate-High
Plantability Potential	High-Low	High-Moderate
Hydrologic Soil Group	C	C
Potential for Roadbed Damage	Moderate	Moderate
Inclusions (10%)	Dunsmuir family Dubakella family Marpa family	
Remarks:	Ishi Pishi families, deep and moderately deep; limitations: high Ca/Mg imbalance limits species.	

**149 Ishi Pishi-Olete families association, 20 to 40 percent slopes**

Map Unit Components	<b>Ishi Pishi family (50%)</b>	<b>Olete family (30%)</b>
Geomorphic Position	Gently sloping sideslopes and benches.	Moderately steep sideslopes and ridge tops.
Typical Vegetation Series	Jeffrey Pine Mixed Conifer Forest	Jeffrey Pine Mixed Conifer Forest

**Soil Profile Description**

Surface Soil	0-7" reddish yellow gravelly loam and gravelly light clay loam, moderate medium granular structure, 20% gravel and cobbles, neutral.	0-6" pale brown gravelly loam, weak very fine granular structure, 30% gravel, slightly acid.
Subsoil	7-34" brown to strong brown gravelly clay loam to dark yellowish brown extremely gravelly or cobbly clay, moderate to strong fine subangular blocky structure, 30-80% gravel and cobbles, neutral.	6-35" light yellowish brown very gravelly loam to brownish yellow very cobbly heavy loam, weak very fine to coarse subangular blocky structure, 35-55% gravel and cobbles, slightly acid to neutral.
Substratum	34-42" fractured ultramafic.	35-38" fractured ultramafic rock.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	5-6	5
Adapted Species Group	JP, IC, DF	DF, PP, SP
Soil Erodibility	Moderate	Low
AWC for Profile Depth	3.5-4.1	2.5-4.0
AWC for Surface 24"	1.8-3.0	1.6-3.1
Seedling Survival Potential	Low-Moderate	Low-Moderate
Plantability Potential	Moderate	Moderate
Hydrologic Soil Group	C	B
Potential for Roadbed Damage	Moderate	Moderate
Inclusions (20%)	Konocti family Ishi Pishi family, deep	
Remarks:	Ishi Pishi family, moderately deep; limitations: high Ca/Mg imbalance limits species.	

**150 Ishi Pishi-Olete families complex. 40 to 70 percent slopes**

Map Unit Components	<b>Ishi Pishi family (50%)</b>	<b>Olete family (30%)</b>
Geomorphic Position	Steep to very steep, dissected mountain sideslopes.	Steep to very steep dissected mountain sideslopes.
Typical Vegetation Series	Jeffrey Pine Mixed Conifer Forest	Jeffrey Pine Mixed Conifer Forest

**Soil Profile Description**

Surface Soil	0-7" reddish yellow gravelly loam and gravelly light clay loam, moderate medium granular structure, 20% gravel and cobbles, neutral.	0-6" pale brown gravelly loam, weak very fine granular structure, 30% gravel, slightly acid.
Subsoil	7-34" brown to strong brown gravelly clay loam to dark yellowish brown extremely gravelly or cobbly clay, moderate to strong fine subangular blocky structure, 30-80% gravel and cobbles, neutral.	6-35" light yellowish brown very gravelly loam to brownish yellow very cobbly heavy loam, weak very fine to coarse subangular blocky structure, 35-55% gravel and cobbles, slightly acid to neutral.
Substratum	34-42" fractured ultramafic.	35-38" fractured ultramafic rock.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	5-6	5
Adapted Species Group	JP, IC, DF	DF, PP, SP
Soil Erodibility	Moderate	Low
AWC for Profile Depth	3.5-4.1	2.5-4.0
AWC for Surface 24"	1.8-3.0	1.6-3.1
Seedling Survival Potential	Low-Moderate	Low-Moderate
Plantability Potential	Low-Moderate	Low-Moderate
Hydrologic Soil Group	C	B
Potential for Roadbed Damage	Moderate	Moderate

Inclusions (20%)  
 Weitchpec family  
 Konocti family  
 Lithic Haploxeralfs

Remarks: Ishi Pishi family, moderately deep; limitations: high Ca/Mg imbalance limits species.

**151 Ishi Pishi-Tamflat families association, 35 to 60 percent slopes**

**Map Unit Components**

**Ishi Pishi family (55%)**

**Tamflat family (35%)**

**Geomorphic Position**

Moderately steep to steep, complex slightly dissected, linear to convex, smooth to broken mountain sideslopes.

Similar position as Ishi Pishi family.

**Typical Vegetation Series**

Jeffrey Pine Mixed Conifer Forest, Jeffrey Pine-Incense Cedar - Woodland

Very open Jeffrey Pine - Incense Cedar - Woodland

**Soil Profile Description**

**Surface Soil**

0-7" reddish yellow gravelly loam and gravelly light clay loam, moderate medium granular structure, 20% gravel and cobbles, neutral.

0-1" brown very cobbly loam, moderate thin and medium platy structure, 58% gravel and cobbles, neutral.

**Subsoil**

7-34" brown to strong brown gravelly clay loam to dark yellowish brown extremely gravelly or cobbly clay, moderate to strong fine subangular blocky structure, 30-80% gravel and cobbles, neutral.

1-19" yellowish red extremely gravelly clay loam and strong brown extremely gravelly clay, moderate medium to strong fine subangular blocky structure, 62-75% gravel and cobbles, mildly alkaline to neutral.

**Substratum**

34-42" fractured ultramafic.

19-24" high fractured ultramafic rock.

**Soil Properties & Management Interpretations**

**Forest Survey Site Class**

5-6

6-7

**Adapted Species Group**

JP, IC, DF

BL, JP, IC, DF

**Soil Erodibility**

Moderate

Moderate

**AWC for Profile Depth**

3.5-4.1

1.7-3.9

**AWC for Surface 24"**

1.8-3.0

1.7-2.8

**Seedling Survival Potential**

Low-Moderate

Low-Moderate

**Plantability Potential**

High-Low

Low-V. Low

**Hydrologic Soil Group**

C

C-D

**Potential for Roadbed Damage**

Moderate

Low

**Inclusions (10%)**

Ishi Pishi family, deep  
Rock outcrop, ultramafic  
Beaughton family  
Lithic Haploxerafs

**Remarks:**

Ishi Pishi limitations: Ca/Mg imbalance limits species. Tamflat limitations: Ca/Mg imbalance and possible toxicity.

**152 Ishi Pishi, deep-Dubakella families complex, 20 to 40 percent slopes**

<b>Map Unit Components</b>	<b>Ishi Pishi family, deep (55%)</b>	<b>Dubakella family (25%)</b>
<b>Geomorphic Position</b>	Moderately steep to steep broken mountain sideslopes.	Moderately steep broken mountain sideslopes.
<b>Typical Vegetation Series</b>	Jeffrey Pine Mixed Conifer Forest, Sierran-Cascade Mixed Conifer Forest	Jeffrey Pine Mixed Conifer Forest, Sierran-Cascade Mixed Conifer Forest

**Soil Profile Description**

<b>Surface Soil</b>	0-3" brown heavy gravelly loam, weak fine granular structure, 30% gravel, neutral.	0-11" reddish brown cobbly loam and very stony clay loam, weak and moderate very fine subangular blocky structure, 30 to 50% gravel, cobbles and stones, neutral.
<b>Subsoil</b>	3-48" yellowish red very gravelly heavy clay loam to heavy yellowish brown very cobbly clay, moderate to strong fine subangular blocky structure, 35-55% gravel and cobbles, slightly acid to neutral.	11-18" strong brown extremely stony clay, strong fine subangular blocky structure, 65% gravel and stones, mildly alkaline.
<b>Substratum</b>	48-52" fractured, moderately weathered ultramafic rock.	18-26" strong brown extremely stony clay, massive, 85% gravel and stones, mildly alkaline, 26-30" ultramafic rock.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	4-5	5-6
<b>Adapted Species Group</b>	JP, IC, DF, WWP	JP, IC, DF
<b>Soil Erodibility</b>	Moderate	High
<b>AWC for Profile Depth</b>	5.0-6.9	1.8-4.2
<b>AWC for Surface 24"</b>	2.0-3.8	1.8-3.0
<b>Seedling Survival Potential</b>	Moderate-High	Low-Moderate
<b>Plantability Potential</b>	High-Moderate	High-Moderate
<b>Hydrologic Soil Group</b>	C	C
<b>Potential for Roadbed Damage</b>	Moderate	Moderate
<b>Inclusions (20%)</b>	Weitchpec family Ishi Pishi family Beaughton family Dunsmuir family Rock outcrop, ultramafic Shadeleaf family	
<b>Remarks:</b>	Ca/Mg imbalance, may limits species and growth on soil from ultramafics.	

**153 Ishi Pishi family, deep, -Ishi Pishi family complex, 20 to 40 percent slopes**

<b>Map Unit Components</b>	<b>Ishi Pishi, deep (50%)</b>	<b>Ishi Pishi family (30%)</b>
<b>Geomorphic Position</b>	Moderately steep mountain sideslopes and benches.	Moderately steep mountain sideslopes and benches.
<b>Typical Vegetation Series</b>	Klamath Enriched Mixed Conifer Forest	Klamath Enriched Mixed Conifer Forest

**Soil Profile Description**

<b>Surface Soil</b>	0-3" brown heavy gravelly loam, weak fine granular structure, 30% gravel, neutral.	0-7" reddish yellow gravelly loam and gravelly light clay loam, moderate medium granular structure, 20% gravel and cobbles, neutral.
<b>Subsoil</b>	3-48" yellowish red very gravelly heavy clay loam to heavy yellowish brown very cobbly clay, moderate to strong fine subangular blocky structure, 35-55% gravel and cobbles, slightly acid to neutral.	7-34" brown to strong brown gravelly clay loam to dark yellowish brown extremely gravelly or cobbly clay, moderate to strong fine subangular blocky structure, 30-80% gravel and cobbles, neutral.
<b>Substratum</b>	48-52" fractured, moderately weathered ultramafic rock.	34-42" fractured ultramafic.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	4-5	5-6
<b>Adapted Species Group</b>	JP, IC, DF, WWP	JP, IC, DF
<b>Soil Erodibility</b>	Moderate	Moderate
<b>AWC for Profile Depth</b>	5.0-6.9	3.5-4.1
<b>AWC for Surface 24"</b>	2.0-3.8	1.8-3.0
<b>Seedling Survival Potential</b>	Moderate-High	Low-Moderate
<b>Plantability Potential</b>	High-Low	High-Low
<b>Hydrologic Soil Group</b>	C	C
<b>Potential for Roadbed Damage</b>	Moderate	Moderate

**Inclusions (20%)**  
 Dunsmuir family  
 Konocti family  
 Olete family  
 Tamflat family  
 Holland family, deep

**Remarks:** Ca/Mg imbalance, may limit species and growth on soils from ultramafics.

**154 Ishi Pishi family, deep-Ishi Pishi family complex, 40 to 70 percent slopes**

<b>Map Unit Components</b>	<b>Ishi Pishi, deep (45%)</b>	<b>Ishi Pishi family (30%)</b>
<b>Geomorphic Position</b>	Highly dissected steep to very steep, broken mountain sideslopes and benches.	Compound, highly dissected steep to very steep, convex, undulating mountain sideslopes and benches (stabilized landflows).
<b>Typical Vegetation Series</b>	Klamath Enriched Mixed Conifer Forest, Sierran-Cascade Mixed Conifer Forest	Klamath Enriched Mixed Conifer Forest, Sierran-Cascade Mixed Conifer Forest

**Soil Profile Description**

<b>Surface Soil</b>	0-3" brown heavy gravelly loam, weak fine granular structure, 30% gravel, neutral.	0-7" reddish yellow gravelly loam and gravelly light clay loam, moderate medium granular structure, 20% gravel and cobbles, neutral.
<b>Subsoil</b>	3-48" yellowish red very gravelly heavy clay loam to heavy yellowish brown very cobbly clay, moderate to strong fine subangular blocky structure, 35-55% gravel and cobbles, slightly acid to neutral.	7-34" brown to strong brown gravelly clay loam to dark yellowish brown extremely gravelly or cobbly clay, moderate to strong fine subangular blocky structure, 30-80% gravel and cobbles, neutral.
<b>Substratum</b>	48-52" fractured, moderately weathered ultramafic rock.	34-42" fractured ultramafic.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	4-5	5-6
<b>Adapted Species Group</b>	JP, IC, DF, WWP	JP, IC, DF
<b>Soil Erodibility</b>	Moderate	Moderate
<b>AWC for Profile Depth</b>	5.0-6.9	3.5-4.1
<b>AWC for Surface 24"</b>	2.0-3.8	1.8-3.0
<b>Seedling Survival Potential</b>	Moderate-High	Low-Moderate
<b>Plantability Potential</b>	High-Low	High-Low
<b>Hydrologic Soil Group</b>	C	C
<b>Potential for Roadbed Damage</b>	Moderate	Moderate

**Inclusions (25%)**  
 Dunsmuir family  
 Konocti family  
 Olete family  
 Tamflat family  
 Holland family, deep

**Remarks:** Ca/Mg imbalance, may limit species and growth on soils from ultramafics.

**155 Jayar family, 40 to 60 percent slopes**

Map Unit Components	<b>Jayar family (75%)</b>
Geomorphic Position	Steep, dissected linear, upper mountain sideslopes.
Typical Vegetation Series	White Fir Forest - Mixed Conifer Forest - Red Fir-White Fir Forest

**Soil Profile Description**

Surface Soil	0-5" light gray very gravelly sandy loam, moderate medium granular structure, 40% gravel and cobbles, medium acid.
Subsoil	5-26" light brownish gray very cobbly very fine sandy loam and light gray very cobbly loam, weak medium subangular blocky structure, 42-55% cobbles and gravel, strongly to slightly acid.
Substratum	26-36" moderately fractured unweathered basic intrusive rock.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	5-6
Adapted Species Group	WF, JP, SP, DF
Soil Erodibility	Low
AWC for Profile Depth	2.0-4.0
AWC for Surface 24"	2.0-3.2
Seedling Survival Potential	Moderate-High
Plantability Potential	High-Moderate
Hydrologic Soil Group	B
Potential for Roadbed Damage	Moderate
Inclusions (25%)	Jayar family, deep Skymor family Rock outcrop, basic intrusive

Remarks:

**156 Jayar family, 60 to 80 percent slopes**

Map Unit Components	<b>Jayar family (75%)</b>
Geomorphic Position	Very steep, dissected linear mountain sideslopes.
Typical Vegetation Series	Mixed Conifer - Fir Forest, White Fir Forest - Mixed Upper Montane Coniferous Forest

**Soil Profile Description**

Surface Soil	0-5" light gray very gravelly sandy loam, moderate medium granular structure, 40% gravel and cobbles, medium acid.
Subsoil	5-26" light brownish gray very cobbly very fine sandy loam and light gray very cobbly loam, weak medium subangular blocky structure, 42-55% cobbles and gravel, strongly to slightly acid.
Substratum	26-36" moderately fractured unweathered basic intrusive rock.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	5-6
Adapted Species Group	WF, JP, SP, DF
Soil Erodibility	Low
AWC for Profile Depth	2.0-4.0
AWC for Surface 24"	2.0-3.2
Seedling Survival Potential	Moderate
Plantability Potential	High-Low
Hydrologic Soil Group	B
Potential for Roadbed Damage	Moderate
Inclusions (25%)	Wapal family Rock outcrop, basic igneous Jayar family, deep Merkel family

Remarks:

**157 Jayar-Skymor families, 20 to 40 percent slopes**

<b>Map Unit Components</b>	<b>Jayar family (45%)</b>	<b>Skymor family (30%)</b>
<b>Geomorphic Position</b>	Moderately steep, dissected, linear to broken upper mountain sideslopes.	Moderately steep ridge tops and upper sideslopes.
<b>Typical Vegetation Series</b>	White Fir Forest - Mixed Upper Montane Coniferous Forest	Upper Montane Mixed Chaparral Very Open Mixed Upper Montane Coniferous Forest

**Soil Profile Description**

<b>Surface Soil</b>	0-5" light gray very gravelly sandy loam, moderate medium granular structure, 40% gravel and cobbles, medium acid.	0-3" brown extremely cobbly sandy loam, single grain 65% gravel, cobbles and stones, slightly acid.
<b>Subsoil</b>	5-26" light brownish gray very cobbly very fine sandy loam and light gray very cobbly loam, weak medium subangular blocky structure, 42-55% cobbles and gravel, strongly to slightly acid.	3-17" yellowish brown extremely stony sandy loam and very pale brown extremely cobbly loam, weak fine and moderate medium subangular blocky structure, 65% gravel, cobbles and stones, medium and strongly acid.
<b>Substratum</b>	26-36" moderately fractured unweathered basic intrusive rock.	17-19" fractured basic igneous rock.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	5-6	6-7
<b>Adapted Species Group</b>	WF, JP, SP, DF	BL, WF, JP, SP
<b>Soil Erodibility</b>	Low	Low
<b>AWC for Profile Depth</b>	2.0-4.0	0.9-2.0
<b>AWC for Surface 24"</b>	2.0-3.2	0.9-1.7
<b>Seedling Survival Potential</b>	Moderate	V. Low-Low
<b>Plantability Potential</b>	High-Low	Low
<b>Hydrologic Soil Group</b>	B	C-D
<b>Potential for Roadbed Damage</b>	Moderate	Low
<b>Inclusions (25%)</b>	Wapal family Rock outcrop, basic igneous Jayar family, deep Merkel family	

**Remarks:**

**158 Jayar-Skymor families complex, 40 to 60 percent slopes**

Map Unit Components

**Jayar family (40%)**

**Skymor family (35%)**

Geomorphic Position

Steep, dissected linear to broken upper mountain sideslopes.

Ridge tops and sideslopes as described for Jayar family.

Typical Vegetation Series

White Fir Forest - Mixed Upper Montane Coniferous Forest

Upper Montane Mixed Chaparral Very Open Coniferous Forest

**Soil Profile Description**

Surface Soil

0-5" light gray very gravelly sandy loam, moderate medium granular structure, 40% gravel and cobbles, medium acid.

0-3" brown extremely cobbly sandy loam, single grain 65% gravel, cobbles and stones, slightly acid.

Subsoil

5-26" light brownish gray very cobbly very fine sandy loam and light gray very cobbly loam, weak medium subangular blocky structure, 42-55% cobbles and gravel, strongly to slightly acid.

3-17" yellowish brown extremely stony sandy loam and very pale brown extremely cobbly loam, weak fine and moderate medium subangular blocky structure, 65% gravel, cobbles and stones, medium and strongly acid.

Substratum

26-36" moderately fractured unweathered basic intrusive rock.

17-19" fractured basic igneous rock.

**Soil Properties & Management Interpretations**

Forest Survey Site Class

5-6

6-7

Adapted Species Group

WF, JP, SP, DF

BL, WF, JP, SP

Soil Erodibility

Low

Low

AWC for Profile Depth

2.0-4.0

0.9-2.0

AWC for Surface 24"

2.0-3.2

0.9-1.7

Seedling Survival Potential

Moderate-High

V. Low-Low

Plantability Potential

V. Low-Low

V. Low

Hydrologic Soil Group

B

C-D

Potential for Roadbed Damage

Moderate

Low

Inclusions (25%)

Wapal family  
Rock outcrop  
Rubble land

Remarks:

Also mapped on metamorphic geology.

**159 Jayar-Skymor families complex, 60 to 80 percent slopes**

<b>Map Unit Components</b>	<b>Jayar family (40%)</b>	<b>Skymor family (35%)</b>
<b>Geomorphic Position</b>	Very steep dissected, linear to broken upper mountain sideslopes.	Very steep mountain upper sideslopes.
<b>Typical Vegetation Series</b>	White Fir Forest - Mixed Upper Montane Coniferous Forest	Upper Montane Mixed Chaparral Very Open Coniferous Forest

**Soil Profile Description**

<b>Surface Soil</b>	0-5" light gray very gravelly sandy loam, moderate medium granular structure, 40% gravel and cobbles, medium acid.	0-3" brown extremely cobbly sandy loam, single grain 65% gravel, cobbles and stones, slightly acid.
<b>Subsoil</b>	5-26" light brownish gray very cobbly very fine sandy loam and light gray very cobbly loam, weak medium subangular blocky structure, 42-55% cobbles and gravel, strongly to slightly acid.	3-17" yellowish brown extremely stony sandy loam and very pale brown extremely cobbly loam, weak fine and moderate medium subangular blocky structure, 65% gravel, cobbles and stones, medium and strongly acid.
<b>Substratum</b>	26-36" moderately fractured unweathered basic intrusive rock.	17-19" fractured basic igneous rock.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	5-6	6-7
<b>Adapted Species Group</b>	WF, JP, SP, DF	BL, WF, JP, SP
<b>Soil Erodibility</b>	Low	Low
<b>AWC for Profile Depth</b>	2.0-4.0	0.9-2.0
<b>AWC for Surface 24"</b>	2.0-3.2	0.9-1.7
<b>Seedling Survival Potential</b>	Moderate-High	V. Low-Low
<b>Plantability Potential</b>	V. Low-Low	V. Low
<b>Hydrologic Soil Group</b>	B	C-D
<b>Potential for Roadbed Damage</b>	Moderate	Low
<b>Inclusions (25%)</b>	Rock outcrop, metamorphic bedrock Rubble land	
<b>Remarks:</b>	Also mapped on metamorphic geology.	

**160 Jayar family, deep, 30 to 50 percent slopes**

Map Unit Components	<b>Jayar family, deep (75%)</b>
Geomorphic Position	Moderately steep to steep, linear, to broken, mountain sideslopes.
Typical Vegetation Series	White Fir Forest Klamath Enriched Mixed Conifer

**Soil Profile Description**

Surface Soil	0-4" yellowish brown very gravelly sandy loam, strong fine and very fine granular structure, 40% gravel and cobbles, strongly acid.
Subsoil	4-20" yellowish brown very gravelly sandy loam, weak fine subangular blocky structure, 45 to 50% gravel and cobbles, medium acid.
Substratum	20-48" pale yellow extremely stony coarse sandy loam and light yellowish brown extremely stony loamy sand, single grain, 62-75% gravel and stones, slightly acid. 48-50" hard, compacted glacial till.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	3-5
Adapted Species Group	WF, JP, SP, DF
Soil Erodibility	Low
AWC for Profile Depth	3.0-4.6
AWC for Surface 24"	2.0-2.6
Seedling Survival Potential	Moderate-High
Plantability Potential	High-Moderate
Hydrologic Soil Group	A-B
Potential for Roadbed Damage	Moderate
Inclusions (25%)	Nanny family Rogue family Glacial till, granitic
Remarks:	

**161 Jayar, deep-Skymor families association, 15 to 35 percent slopes**

<b>Map Unit Components</b>	<b>Jayar family, deep (60%)</b>	<b>Skymor family (25%)</b>
<b>Geomorphic Position</b>	Gently sloping mountain sideslopes.	Steep mountain sideslopes.
<b>Typical Vegetation Series</b>	Klamath Enriched Mixed Conifer, Mixed Upper Montane Coniferous Forest Huckleberry Oak Chaparral	Huckleberry Oak Chaparral Scree/Conifer

**Soil Profile Description**

<b>Surface Soil</b>	0-4" yellowish brown very gravelly sandy loam, strong fine and very fine granular structure, 40% gravel and cobbles, strongly acid.	0-3" brown extremely cobbly sandy loam, single grain 65% gravel, cobbles and stones, slightly acid.
<b>Subsoil</b>	4-20" yellowish brown very gravelly sandy loam, weak fine subangular blocky structure, 45 to 50% gravel and cobbles, medium acid.	3-17" yellowish brown extremely stony sandy loam and very pale brown extremely cobbly loam, weak fine and moderate medium subangular blocky structure, 65% gravel, cobbles and stones, medium and strongly acid.
<b>Substratum</b>	20-48" pale yellow extremely stony coarse sandy loam and light yellowish brown extremely stony loamy sand, single grain, 62-75% gravel and stones, slightly acid. 48-50" hard, compacted glacial till.	17-19" fractured basic igneous rock.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	3-5	6-7
<b>Adapted Species Group</b>	WF, JP, SP, DF	BL, WF, JP, SP
<b>Soil Erodibility</b>	Low	Low
<b>AWC for Profile Depth</b>	3.0-4.6	0.9-2.0
<b>AWC for Surface 24"</b>	2.0-2.6	0.9-1.7
<b>Seedling Survival Potential</b>	Moderate-High	V. Low-Low
<b>Plantability Potential</b>	High-Moderate	V. Low-Low
<b>Hydrologic Soil Group</b>	A-B	C-D
<b>Potential for Roadbed Damage</b>	Moderate	Low
<b>Inclusions (15%)</b>	Rock outcrop, metamorphic Cobbly glacial outwash Jayar family	

**Remarks:**

**162 Jayar family, deep-Typic Cryaquolls association, 5 to 30 percent slopes**

<b>Map Unit Components</b>	<b>Jayar family, deep (65%)</b>	<b>Typic Cryaquolls (15%)</b>
<b>Geomorphic Position</b>	Gently sloping to moderately steep, broken sideslopes.	Similar position as Jayar family.
<b>Typical Vegetation Series</b>	White Fir Forest Klamath Enriched Mixed Conifer	Upper Montane Wet Meadows and Seeps

**Soil Profile Description**

<b>Surface Soil</b>	0-4" yellowish brown very gravelly sandy loam, strong fine and very fine granular structure, 40% gravel and cobbles, strongly acid.	0-7" black sandy loam grayish brown loam, strong coarse granular structure to massive, 0-10% gravel, neutral to strongly acid.
<b>Subsoil</b>	4-20" yellowish brown very gravelly sandy loam, weak fine subangular blocky structure, 45 to 50% gravel and cobbles,	7-9" grayish brown gravelly light clay loam, massive 15% gravel and cobbles, strongly acid.
<b>Substratum</b>	20-48" pale yellow extremely stony coarse sandy loam and light yellowish brown extremely stony loamy sand, single grain, 62-75% gravel and stones, slightly acid. 48-50" hard, compacted glacial till.	9-17" yellowish brown very cobbly sandy clay loam to brown extremely cobbly loamy sand, moderate coarse subangular blocky structure to single grain, 50-75% gravel and cobbles, slightly to strongly acid, water table.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	3-5	7
<b>Adapted Species Group</b>	WF, JP, SP, DF	GL
<b>Soil Erodibility</b>	Low	Low
<b>AWC for Profile Depth</b>	3.0-4.6	Saturated
<b>AWC for Surface 24"</b>	2.0-2.6	Saturated
<b>Seedling Survival Potential</b>	Moderate-High	Saturated
<b>Plantability Potential</b>	High-Moderate	High-Moderate
<b>Hydrologic Soil Group</b>	A-B	D
<b>Potential for Roadbed Damage</b>	Moderate	High
<b>Inclusions (20%)</b>	Rogue family Glacial till, granitic	

Remarks:

**163 Jayar, deep-Wapal families complex, 10 to 50 percent slopes**

<b>Map Unit Components</b>	<b>Jayar family, deep (40%)</b>	<b>Wapal family (35%)</b>
<b>Geomorphic Position</b>	Gentle to moderately steep, broken mountain sideslopes.	Similar position as Jayar family.
<b>Typical Vegetation Series</b>	White Fir Forest Mixed Upper Montane Coniferous Forest	Similar vegetation as Jayar family

**Soil Profile Description**

<b>Surface Soil</b>	0-4" yellowish brown very gravelly sandy loam, strong fine and very fine granular structure, 40% gravel and cobbles, strongly acid.	0-4" brownish yellow very stony loam, weak fine granular structure, 47% gravel and stones, slightly acid.
<b>Subsoil</b>	4-20" yellowish brown very gravelly sandy loam, weak fine subangular blocky structure, 45 to 50% gravel and cobbles, medium acid.	
<b>Substratum</b>	20-48" pale yellow extremely stony coarse sandy loam and light yellowish brown extremely stony loamy sand, single grain, 62-75% gravel and stones, slightly acid. 48-50" hard, compacted glacial till.	4-65" very pale brown very stony sandy loam to light brownish gray extremely stony loamy sand, single grain and massive, 55-80% gravel and cobbles, neutral.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	3-5	5-6
<b>Adapted Species Group</b>	WF, JP, SP, DF	WF, JP, SP
<b>Soil Erodibility</b>	Low	Low
<b>AWC for Profile Depth</b>	3.0-4.6	1.5-3.8
<b>AWC for Surface 24"</b>	2.0-2.6	0.9-2.0
<b>Seedling Survival Potential</b>	Moderate	V. Low-Low
<b>Plantability Potential</b>	Low	Low
<b>Hydrologic Soil Group</b>	A-B	A-B
<b>Potential for Roadbed Damage</b>	Moderate	Moderate
<b>Inclusions (25%)</b>	Skymor family Glacial till Typic Cryaquolls	

Remarks:

**164 Kang-Dewmine families complex, 35 to 70 percent slopes**

<b>Map Unit Components</b>	<b>Kang family (45%)</b>	<b>Dewmine family (30%)</b>
<b>Geomorphic Position</b>	Moderately steep to very steep, mountain sideslopes.	Ridge tops and very steep mountain sideslopes.
<b>Typical Vegetation Series</b>	Jeffrey Pine Mixed Conifer Forest	Very open Jeffrey Pine - Incense Cedar Woodland

**Soil Profile Description**

<b>Surface Soil</b>	0-6" very dark gravelly clay loam, moderate fine granular to strong coarse subangular blocky structure, 10 to 25% gravel and cobbles, neutral to mildly alkaline.	0-5" very dark gray gravelly loam and dark gray very gravelly clay loam, moderate very fine granular and moderate medium subangular blocky structure, 25-35% gravel and cobbles, slightly acid to neutral.
<b>Subsoil</b>	6-19" very dark gray gravelly clay and olive brown very gravelly clay, strong coarse and medium subangular blocky structure, 35 to 50% gravel and cobbles, mildly alkaline.	5-19" dark grayish brown very gravelly clay loam and yellowish brown very gravelly clay, moderate medium and weak coarse subangular blocky structure, 35-50% gravel and cobbles, mildly alkaline.
<b>Substratum</b>	19-28" olive brown extremely cobbly clay, relict rock structure, 70% gravel and cobbles, mildly alkaline. 28-30" fractured, weathered serpentinized peridotite.	19-24" highly fractured serpentinitic rock.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	5-7	7
<b>Adapted Species Group</b>	JP, IC, DF	BL
<b>Soil Erodibility</b>	Moderate	Moderate
<b>AWC for Profile Depth</b>	1.6-3.8	2.0-2.3
<b>AWC for Surface 24"</b>	2.3-2.9	2.0-2.3
<b>Seedling Survival Potential</b>	Moderate	Moderate
<b>Plantability Potential</b>	High-Low	Low
<b>Hydrologic Soil Group</b>	C-D	D
<b>Potential for Roadbed Damage</b>	Moderate	Moderate
<b>Inclusions (25%)</b>	Shadeleaf family Dubakella family Grell family Rock outcrop, ultramafic	
<b>Remarks:</b>	Limitations: Kang and Dewmine families - Ca/Mg imbalance, possible toxicity and poor aeration; Dubakella - Ca/Mg imbalance. (Mg)	

**165 Konocti-Olete families complex, 40 to 70 percent slopes**

Map Unit Components

**Konocti family (50%)**

**Olete family (25%)**

Geomorphic Position

Steep to very steep, dissected mountain sideslopes.

Similar position as Konocti family.

Typical Vegetation Series

Sierran-Cascade Mixed Conifer  
Douglas-Fir-Pine Mixed Conifer Forest

Similar vegetation as Konocti family.

**Soil Profile Description**

Surface Soil

0-3" brown gravelly loam, weak very fine granular structure, 30% gravel and cobbles, slightly acid.

0-6" pale brown gravelly loam, weak very fine granular structure, 30% gravel, slightly acid.

Subsoil

3-22" yellowish red very gravelly loam to dark yellowish brown very stony clay loam, weak fine granular to weak fine subangular blocky structure, 35-45% gravel and cobbles, slightly acid to neutral.

6-35" light yellowish brown very gravelly loam to brownish yellow very cobbly heavy loam, weak very fine to coarse subangular blocky structure, 35-55% gravel and cobbles, slightly acid to neutral.

Substratum

22-30" fractured ultramafic rock.

35-38" fractured ultramafic rock.

**Soil Properties & Management Interpretations**

Forest Survey Site Class

5

5

Adapted Species Group

DF, PP, SP

DF, PP, SP

Soil Erodibility

Moderate

Low

AWC for Profile Depth

2.1-4.5

2.5-4.0

AWC for Surface 24"

2.0-2.6

1.6-3.1

Seedling Survival Potential

Moderate

Low-High

Plantability Potential

Moderate-High

High-Low

Hydrologic Soil Group

B

B

Potential for Roadbed Damage

Moderate

Moderate

Inclusions (25%)

Holland family  
Lithic Haploxeralfs  
Rock outcrop, ultramafic

Remarks:

Ca/Mg imbalance may limit species and growth on ultramafic soils.

**166 Ledmount-Germany families complex, 0 to 10 percent slopes**

Map Unit Components	<b>Ledmount family (60%)</b>	<b>Germany family (30%)</b>
Geomorphic Position	Ash deposits on gently sloping lava flows.	Gently sloping lava flows.
Typical Vegetation Series	Bitterbrush - Golden Scrub Ponderosa Pine Forest	Bitterbrush - Goldenbush Scrub Ponderosa Pine Forest

**Soil Profile Description**

Surface Soil	0-9" dark brown fine sandy loam to brown cobbly sandy loam, single grain to weak medium and coarse subangular blocky structure, 15-25% gravel and cobbles, slightly to medium acid.	0-18" dark grayish brown and dark brown gravelly sandy loam, weak fine and medium granular structure, 15% gravel, slightly acid.
Subsoil	9-13" yellowish brown cobbly sandy loam, weak medium and coarse subangular blocky structure, 25% cobbles and gravel, medium acid.	18-28" brown very gravelly sandy loam, weak medium and coarse subangular blocky structure, 35% gravel, slightly acid.
Substratum	13-14" fractured basalt bedrock.	28-32" brown very gravelly sandy loam, relict rock structure, 60% gravel, slightly acid. 32-34" unweathered basalt.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	7	5
Adapted Species Group	BL	PP
Soil Erodibility	Moderate	Low
AWC for Profile Depth	0.9-1.1	2.2-3.2
AWC for Surface 24"	0.9-1.1	2.5-3.4
Seedling Survival Potential	V. Low-Low	Moderate-High
Plantability Potential	V. Low-Low	Moderate-High
Hydrologic Soil Group	D	B
Potential for Roadbed Damage	Low	High
Inclusions (10%)	Rock outcrop, volcanic	
Remarks:	Typical of recent, level lava flows, often has rubble overburden.	

**167 Ledmount family-Rock outcrop complex, 0 to 10 percent slopes**

<b>Map Unit Components</b>	<b>Ledmount family (60%)</b>	<b>Rock outcrop (30%)</b>
<b>Geomorphic Position</b>	Gently sloping lava flows.	Gently sloping lava flows.
<b>Typical Vegetation Series</b>	Bitterbrush - Goldenbrush Scrub	Scree/Scrub

**Soil Profile Description**

<b>Surface Soil</b>	0-9" dark brown fine sandy loam to brown cobbly sandy loam, single grain to weak medium and coarse subangular blocky structure, 15-25% gravel and cobbles, slightly to medium acid.	
<b>Subsoil</b>	9-13" yellowish brown cobbly sandy loam, weak medium and coarse subangular blocky structure, 25% cobbles and gravel, medium acid.	
<b>Substratum</b>	13-14" fractured basalt bedrock.	Volcanic rock.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	7	
<b>Adapted Species Group</b>	BL	
<b>Soil Erodibility</b>	Moderate	
<b>AWC for Profile Depth</b>	0.9-1.1	
<b>AWC for Surface 24"</b>	0.9-1.1	
<b>Seedling Survival Potential</b>	V. Low-Low	
<b>Plantability Potential</b>	V. Low-Low	
<b>Hydrologic Soil Group</b>	D	D
<b>Potential for Roadbed Damage</b>	Low	Low
<b>Inclusions (10%)</b>	Germany family Delaney family	
<b>Remarks:</b>	Typical of low lava ridges which occur in a random distribution on McCloud RD.	

**168 Lithic Cryumbrepts-Stecum family association, 30 to 50 percent slopes**

<b>Map Unit Components</b>	<b>Lithic Cryumbrepts (40%)</b>	<b>Stecum family (35%)</b>
<b>Geomorphic Position</b>	Moderately steep, dissected, linear, to broken ridge tops.	Similar position as Lithic Cryumbrepts.
<b>Typical Vegetation Series</b>	Chaparral	Red Fir-White Fir Forest, Upper Montane Mixed Conifer, Mixed Chaparral

**Soil Profile Description**

<b>Surface Soil</b>	0-7" dark grayish brown gravelly sandy loam, weak very fine granular structure, 15% gravel, strongly acid, granitic bedrock.	0-5" light olive brown very stony loamy sand, weak fine granular structure, 55% stones and gravel, slightly acid.
<b>Subsoil</b>		
<b>Substratum</b>	7-19" dark brown very cobbly loamy sand, single grain, 50% gravel and cobbles, strongly acid. 19-21" moderately fractured.	5-31" light olive brown extremely stony and olive yellow very stony loamy sand, weak fine and medium subangular blocky structure to massive, 50-70% stones and gravel, slightly acid. 31-34" compacted glacial till.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	7	6-7
<b>Adapted Species Group</b>	BL	BL, RF, JP, WWP
<b>Soil Erodibility</b>	Low	Low
<b>AWC for Profile Depth</b>	0.6-1.5	1.0-1.8
<b>AWC for Surface 24"</b>	0.7-1.5	0.7-1.8
<b>Seedling Survival Potential</b>	V. Low-Low	V. Low-Low
<b>Plantability Potential</b>	Low-V. Low	High-Low
<b>Hydrologic Soil Group</b>	C-D	A
<b>Potential for Roadbed Damage</b>	Moderate	Moderate

**Inclusions (25%)**  
 Lithic Xerumbrepts  
 Nanny family  
 Rubble land, granitic

**Remarks:** Lithic Cryumbrepts and Stecum family limitations: Extreme cold and short growing season.

**169 Lithic Haploxeralfs-Rock outcrop-Weitchpec family association, 70 to 90 percent slopes**

<b>Map Unit Components</b>	<b>Lithic Haploxeralfs (50%)</b>	<b>Rock outcrop (25%)</b>	<b>Weitchpec family (20%)</b>
<b>Geomorphic Position</b>	Very steep, linear, ridge tops.	Similar to topography as described for Lithic Haploxeralfs.	Similar to topography as described for Lithic Haploxeralfs.
<b>Typical Vegetation Series</b>	Open Jeffrey Pine - Incense Cedar Woodland, Upper Montane Serpentine Barrens		Jeffrey Pine - Incense Cedar Woodland

**Soil Profile Description**

<b>Surface Soil</b>	0-4" pale brown gravelly loam and yellowish brown very gravelly loam, moderate coarse platy and moderate medium subangular blocky structure, 20 to 35% gravel, slightly acid to neutral.	0-5" light gray gravelly loam, moderate fine and medium granular structure, 30% gravel, slightly acid.
<b>Subsoil</b>	4-17" light yellowish brown very gravelly loam to yellowish brown very gravelly sandy clay loam, moderate fine, medium and coarse subangular blocky structure, 40 to 50 percent gravel, mildly to moderately alkaline.	5-25" white to pale yellow very gravelly loam, moderate fine subangular blocky structure, 35 to 45 percent gravel, slightly acid to neutral.
<b>Substratum</b>	17-24" moderately fractured serpentine rock.	25-38" highly fractured ultramafic rock.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	7	5-6	
<b>Adapted Species Group</b>	GL, BL	JP,IC,DF	
<b>Soil Erodibility</b>	Moderate	Moderate	
<b>AWC for Profile Depth</b>	1.3-1.8	2.4-4.0	
<b>AWC for Surface 24"</b>	1.3-1.7	2.0-2.7	
<b>Seedling Survival Potential</b>	Low		
<b>Plantability Potential</b>	V. Low	Low	
<b>Hydrologic Soil Group</b>	C-D	D	B
<b>Potential for Roadbed Damage</b>	Low	Low	
<b>Inclusions (5%)</b>	Rubble land, ultramafic		
<b>Remarks:</b>	Limitations: Lithic Haploxeralfs and Weitchpec families subject to Ca/Mg imbalance and toxicity.		
<b>Map Unit Components</b>			

**170 Lithic Haploxeralfs-ToadLake family-Rock outcrop association, 60 to 80 percent slopes**

<b>Map Unit Components</b>	<b>Lithic Haploxeralfs (20%)</b>	<b>ToadLake family (40%)</b>	<b>Rock outcrop (20%)</b>
<b>Geomorphic Position</b>	Dissected, very steep, linear, mountain sideslopes.	Topography similar to that described for Lithic Haploxeralfs.	Topography similar to that described for Lithic Haploxeralfs.
<b>Typical Vegetation Series</b>	Very open Jeffrey Pine - Incense Cedar Woodland, Upper Montane Serpentine Semi-Barrens.	Jeffrey Pine Mixed Conifer Forest	

**Soil Profile Description**

<b>Surface Soil</b>	0-4" pale brown gravelly loam and yellowish brown very gravelly loam, moderate coarse platy and moderate medium subangular blocky structure, 20 to 35 percent gravel, slightly acid to neutral.	0-10" grayish brown and light gray very gravelly loam, moderate very fine granular and very fine subangular blocky structure, 35-45% gravel and cobbles, slightly acid to neutral.
<b>Subsoil</b>	4-17" light yellowish brown very gravelly loam to yellowish brown very gravelly sandy clay loam, moderate fine, medium and coarse subangular blocky structure, 40 to 50 percent gravel, mildly to moderately alkaline.	10-56" light brownish gray very gravelly sandy clay loam to light yellowish brown very gravelly clay loam, moderate fine to weak coarse subangular blocky structure, 45-50% gravel and cobbles, mildly alkaline.
<b>Substratum</b>	17-24" moderately fractured serpentine rock.	56-59" hard, moderately fractured ultramafic rock.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	7	5
<b>Adapted Species Group</b>	GL, BL	JP, WWP, WF
<b>Soil Erodibility</b>	Moderate	Moderate
<b>AWC for Profile Depth</b>	1.3-1.8	3.5-5.6
<b>AWC for Surface 24"</b>	1.3-1.7	2.0-3.0
<b>Seedling Survival Potential</b>	Low	Moderate
<b>Plantability Potential</b>	High - Low	Low
<b>Hydrologic Soil Group</b>	C - D	B - C
<b>Potential for Roadbed Damage</b>	Low	Moderate
<b>Inclusions 10%</b>	Gozem family	
<b>Remarks:</b>	Lithic Haploxeralfs and Toadlake families subject to Ca/Mg imbalance and possible toxicity.	

**171 Lithic Xerumbrepts-Rock outcrop, association, 50 to 80 percent slopes**

<b>Map Unit Components</b>	<b>Lithic Xerumbrepts (65%)</b>	<b>Rock outcrop (25%)</b>
<b>Geomorphic Position</b>	Shallowly dissected, steep to very steep, linear, ridge tops.	Topography as described for Lithic Xerumbrepts, cold.
<b>Typical Vegetation Series</b>	Upper Montane Mixed Chaparral	

**Soil Profile Description**

<b>Surface Soil</b>	0-12" very dark grayish brown very cobbly fine sandy loam and dark yellowish brown cobbly loamy sand, moderate very fine granular and weak medium subangular blocky structure, 30-40% cobbles and gravel, medium to very strongly acid.	
<b>Subsoil</b>		
<b>Substratum</b>	12-19" yellowish brown very cobbly loamy sand, single grain, 55% gravel and cobbles, medium acid. 19-21" moderately weathered and fractured quartz monzonite.	Granitic rock outcrop.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	6-7	
<b>Adapted Species Group</b>	BL, WF, JP, SP	
<b>Soil Erodibility</b>	Low	
<b>AWC for Profile Depth</b>	0.5-1.5	
<b>AWC for Surface 24"</b>	0.6-1.4	
<b>Seedling Survival Potential</b>	V. Low-Low	
<b>Plantability Potential</b>	Low-V. Low	
<b>Hydrologic Soil Group</b>	B-C	D
<b>Potential for Roadbed Damage</b>	Moderate	Low
<b>Inclusions (10%)</b>	Nanny family	
<b>Remarks:</b>		

**172 Lithic Xerumbrepts-Rubble land-Nanny family complex, 5 to 40 percent slopes**

Map Unit Components	<b>Lithic Xerumbrepts (50%)</b>	<b>Rubble land (20%)</b>	<b>Nanny family (15%)</b>
Geomorphic Position	Gentle to moderately steep, ground and lateral moraines and cirque bottoms.	Similar position as Lithic Xerumbrepts.	Similar position as Lithic Xerumbrepts.
Typical Vegetation Series	Upper Montane Mixed Chaparral.		White Fir Forest

**Soil Profile Description**

Surface Soil	0-12" very dark grayish brown very cobbly fine sandy loam and dark yellowish brown cobbly loamy sand, moderate very fine granular and weak medium subangular blocky structure, 30-40% cobbles and gravel, medium to very strongly acid.		0-13" black very cobbly fine sandy loam, moderate very fine granular structure, 55% gravel and cobbles, medium acid.
Subsoil			13-29" yellowish brown extremely gravelly sandy loam, weak fine subangular blocky structure, 70% gravel and cobbles, slightly acid.
Substratum	12-19" yellowish brown very cobbly loamy sand, single grain, 55% gravel and cobbles, medium acid. 19-21" moderately weathered and fractured quartz monzonite.	Granitic glacial till.	29-48" pale brown extremely cobbly loamy sand, single grain, 70-80% gravel and cobbles, slightly acid. 48-60" gravel and cobbles with sand in voids.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	6-7		5
Adapted Species Group	BL, WF, JP, SP		WF, JP, SP
Soil Erodibility	Low		Low
AWC for Profile Depth	0.5-1.5		2.0-3.5
AWC for Surface 24"	0.6-1.4		1.4-2.4
Seedling Survival Potential	V. Low-Low		Low-Moderate
Plantability Potential	Low		Low
Hydrologic Soil Group	B-C	D	A
Potential for Roadbed Damage	Moderate	Low	Moderate
Inclusions (15%)	Skymor family Jayar family, deep Tallac family Rock outcrop, granitic		

Remarks:

**173 Lostspring family, 0 to 10 percent slopes**

Map Unit Components	<b>Lotspring family (80%)</b>
Geomorphic Position	Gently sloping outwash flats and terraces.
Typical Vegetation Series	Lodgepole Pine Forest Red Fir Forest

**Soil Profile Description**

Surface Soil	24" brown very cindery coarse sand and very pale brown extremely cindery coarse sand, single grain, 40-90% gravel cinders, slightly acid.
Subsoil	
Substratum	24-60" yellowish brown gravelly sandy loam, weak medium and coarse subangular blocky structure, 15-20% gravel, slightly acid.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	5
Adapted Species Group	LPP, WF, RF, JP
Soil Erodibility	Low
AWC for Profile Depth	6.6-7.4
AWC for Surface 24"	4.2-4.6
Seedling Survival Potential	Low
Plantability Potential	High
Hydrologic Soil Group	A
Potential for Roadbed Damage	High
Inclusions (20%)	Yallani family, pumice overburden phase Yallani family
Remarks:	Despite the high AWC values for pumice soils, the potential for regeneration is limited. The most limiting factor is the depth of pumice. Repeated attempts at establishing seedlings in pumice have been unsuccessful; it appears necessary for the roots to reach finer textured material beneath. High albedo, adverse thermal properties and very low inherent fertility are additional limiting factors for regeneration on pumice soils.

## 174 Marpa family, 20 to 40 percent slopes

Map Unit Components	<b>Marpa family (75%)</b>
Geomorphic Position	Moderately steep, dissected mountain sideslopes, toe slopes.
Typical Vegetation Series	Douglas-fir-Pine Mixed Conifer Forest, Mixed Conifer Black Oak Forest

### Soil Profile Description

Surface Soil	0-13" brown heavy loam and gravelly light clay loam, moderate and weak medium granular structure, 5-35% gravel, slightly acid.
Subsoil	13-26" light brown very gravelly clay loam, massive, 40-50% gravel, strongly acid.
Substratum	26-32" fractured shale.

### Soil Properties & Management Interpretations

Forest Survey Site Class	5
Adapted Species Group	DF, PP, SP
Soil Erodibility	Moderate
AWC for Profile Depth	2.0-4.5
AWC for Surface 24"	1.6-3.3
Seedling Survival Potential	Low-High
Plantability Potential	High-Moderate
Hydrologic Soil Group	B
Potential for Roadbed Damage	Moderate
Inclusions (25%)	Neuns family Holland family, deep Holland family Rock outcrop, metamorphic

Remarks:

**175 Marpa family, 40 to 60 percent slopes**

Map Unit Components	<b>Marpa family (75%)</b>
Geomorphic Position	Steep, dissected mountain sideslopes.
Typical Vegetation Series	Douglas-fir-Pine Mixed Conifer Forest, Mixed Conifer Black Oak Forest

**Soil Profile Description**

Surface Soil	0-13" brown heavy loam and gravelly light clay loam, moderate and weak medium granular structure, 5-35% gravel, slightly acid.
Subsoil	13-26" light brown very gravelly clay loam, massive, 40-50% gravel, strongly acid.
Substratum	26-32" fractured shale.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	5
Adapted Species Group	DF, PP, SP
Soil Erodibility	Moderate
AWC for Profile Depth	2.0-4.5
AWC for Surface 24"	1.6-3.3
Seedling Survival Potential	Low-High
Plantability Potential	Moderate-High
Hydrologic Soil Group	B
Potential for Roadbed Damage	Moderate
Inclusions (25%)	Neuns family Holland family Deadwood family Rock outcrop, metamorphic

Remarks:

**176 Marpa family, 60 to 80 percent slopes**

Map Unit Components	<b>Marpa family (75%)</b>
Geomorphic Position	Very steep, dissected mountain sideslopes.
Typical Vegetation Series	Douglas-fir-Pine Mixed Conifer Forest, Mixed Conifer Black Oak Forest

**Soil Profile Description**

Surface Soil	0-13" brown heavy loam and gravelly light clay loam, moderate and weak medium granular structure, 5-35% gravel, slightly acid.
Subsoil	13-26" light brown very gravelly clay loam, massive, 40-50% gravel, strongly acid.
Substratum	26-32" fractured shale.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	5
Adapted Species Group	DF, PP, SP
Soil Erodibility	Moderate
AWC for Profile Depth	2.0-4.5
AWC for Surface 24"	1.6-3.3
Seedling Survival Potential	Low-High
Plantability Potential	Low
Hydrologic Soil Group	B
Potential for Roadbed Damage	Moderate
Inclusions (25%)	Neuns family Deadwood family Rock outcrop, metamorphic
Remarks:	

**177 Marpa-Chawanakee families complex, 40 to 60 percent slopes**

<b>Map Unit Components</b>	<b>Marpa family (60%)</b>	<b>Chawanakee family (30%)</b>
<b>Geomorphic Position</b>	Steep linear, dissected broken mountain sideslopes.	Similar position as Marpa family.
<b>Typical Vegetation Series</b>	Douglas-fir-Pine Mixed Conifer Forest, Low Montane & Foothill Mixed Chaparral	Low Montane & Foothill Mixed Chaparral, Whiteleaf Manzanita Chaparral

**Soil Profile Description**

<b>Surface Soil</b>	0-13" brown heavy loam and gravelly light clay loam, moderate and weak medium granular structure, 5-35% gravel, slightly acid.	0-6" light brownish gravelly sandy loam and light gray gravelly loam, weak fine and medium subangular blocky structure 25-30% gravel and cobbles, very strongly acid.
<b>Subsoil</b>	13-26" light brown very gravelly clay loam, massive, 40-50% gravel, strongly acid.	6-11" very pale brown cobbly loam, weak medium and coarse subangular blocky structure, 30% gravel and cobbles, very strongly acid.
<b>Substratum</b>	26-32" fractured shale.	11-20" highly fractured rhyolite bedrock.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	5	6-7
<b>Adapted Species Group</b>	DF, PP, SP	BL, DF, PP, SP
<b>Soil Erodibility</b>	Moderate	Moderate
<b>AWC for Profile Depth</b>	2.0-4.5	1.1-1.6
<b>AWC for Surface 24"</b>	1.6-3.3	1.1-1.9
<b>Seedling Survival Potential</b>	Low-High	Low
<b>Plantability Potential</b>	Moderate	Low
<b>Hydrologic Soil Group</b>	B	C
<b>Potential for Roadbed Damage</b>	Moderate	High
<b>Inclusions (10%)</b>	Neuns family Rock outcrop, metamorphic Deadwood family Goulding family	

**Remarks:**

**178 Marpa-Goulding families association, 20 to 40 percent slopes**

<b>Map Unit Components</b>	<b>Marpa family (50%)</b>	<b>Goulding family (30%)</b>
<b>Geomorphic Position</b>	Moderately steep, dissected mountain sideslopes.	Principally on ridges and southerly aspects of moderately steep, dissected mountain sideslopes.
<b>Typical Vegetation Series</b>	Douglas-fir-Pine Mixed Conifer Forest	Low Montane & Foothill Mixed Chaparral, Canyon Oak Woodland

**Soil Profile Description**

<b>Surface Soil</b>	0-13" brown heavy loam and gravelly light clay loam, moderate and weak medium granular structure, 5-35% gravel, slightly acid.	0-7" yellowish brown very gravelly loam, moderate medium subangular blocky structure, 40% gravel and cobbles, neutral.
<b>Subsoil</b>	13-26" light brown very gravelly clay loam, massive, 40-50% gravel, strongly acid.	7-15" yellowish brown very gravelly loam, moderate medium subangular blocky structure, 55% gravel and cobbles, neutral.
<b>Substratum</b>	26-32" fractured shale.	15-21" fractured metavolcanic rock.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	5	7
<b>Adapted Species Group</b>	DF, PP, SP	BL
<b>Soil Erodibility</b>	Moderate	Moderate
<b>AWC for Profile Depth</b>	2.0-4.5	0.7-1.9
<b>AWC for Surface 24"</b>	1.6-3.3	0.7-1.9
<b>Seedling Survival Potential</b>	Low-High	V. Low-Low
<b>Plantability Potential</b>	Moderate	V. Low-Low
<b>Hydrologic Soil Group</b>	B	D
<b>Potential for Roadbed Damage</b>	Moderate	Low
<b>Inclusions (20%)</b>	Neuns family Rock outcrop, metamorphic Deadwood family	

**Remarks:**

**179 Marpa-Goulding families association, 40 to 60 percent slopes**

<b>Map Unit Components</b>	<b>Marpa family (60%)</b>	<b>Goulding family (30%)</b>
<b>Geomorphic Position</b>	Steep, dissected mountain sideslopes.	Ridge tops and steep, dissected mountain sideslopes.
<b>Typical Vegetation Series</b>	Douglas-fir-Pine Mixed Conifer Forest	Low Montane & Foothill Mixed Chaparral, Canyon Oak Woodland

**Soil Profile Description**

<b>Surface Soil</b>	0-13" brown heavy loam and gravelly light clay loam, moderate and weak medium granular structure, 5-35% gravel, slightly acid.	0-7" yellowish brown very gravelly loam, moderate medium subangular blocky structure, 40% gravel and cobbles, neutral.
<b>Subsoil</b>	13-26" light brown very gravelly clay loam, massive, 40-50% gravel, strongly acid.	7-15" yellowish brown very gravelly loam, moderate medium subangular blocky structure, 55% gravel and cobbles, neutral.
<b>Substratum</b>	26-32" fractured shale.	15-21" fractured metavolcanic rock.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	5	7
<b>Adapted Species Group</b>	DF, PP, SP	BL
<b>Soil Erodibility</b>	Moderate	Moderate
<b>AWC for Profile Depth</b>	2.0-4.5	0.7-1.9
<b>AWC for Surface 24"</b>	1.6-3.3	0.7-1.9
<b>Seedling Survival Potential</b>	Low-High	V. Low-Low
<b>Plantability Potential</b>	Moderate	V. Low-Low
<b>Hydrologic Soil Group</b>	B	D
<b>Potential for Roadbed Damage</b>	Moderate	Low
<b>Inclusions (10%)</b>	Neuns family Rock outcrop, metamorphic Deadwood family	

**Remarks:**

**180 Marpa-Goulding families association, 60 to 80 percent slopes**

Map Unit Components	<b>Marpa family (60%)</b>	<b>Goulding family (30%)</b>
Geomorphic Position	Very steep, dissected mountain sideslopes.	Ridge tops and very steep, dissected sideslopes.
Typical Vegetation Series	Douglas-fir-Pine Mixed Conifer Forest	Canyon Oak Woodland, Low Montane & Foothill Mixed Chaparral

**Soil Profile Description**

Surface Soil	0-13" brown heavy loam and gravelly light clay loam, moderate and weak medium granular structure, 5-35% gravel, slightly acid.	0-7" yellowish brown very gravelly loam, moderate medium subangular blocky structure, 40% gravel and cobbles, neutral.
Subsoil	13-26" light brown very gravelly clay loam, massive, 40-50% gravel, strongly acid.	7-15" yellowish brown very gravelly loam, moderate medium subangular blocky structure, 55% gravel and cobbles, neutral.
Substratum	26-32" fractured shale.	15-21" fractured metavolcanic rock.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	5	7
Adapted Species Group	DF, PP, SP	BL
Soil Erodibility	Moderate	Moderate
AWC for Profile Depth	2.0-4.5	0.7-1.9
AWC for Surface 24"	1.6-3.3	0.7-1.9
Seedling Survival Potential	Low-High	V. Low-Low
Plantability Potential	Low	V. Low
Hydrologic Soil Group	B	D
Potential for Roadbed Damage	Moderate	Low
Inclusions (10%)	Neuns family Rock outcrop, metamorphic Rubble land Deadwood family	

Remarks:

**181 Marpa-Holland, deep families complex, 0 to 20 percent slopes**

<b>Map Unit Components</b>	<b>Marpa family (50%)</b>	<b>Holland family, deep (30%)</b>
<b>Geomorphic Position</b>	Gently sloping broken mountain sideslopes.	Gently sloping toe slopes, benches, and broken mountain sideslopes.
<b>Typical Vegetation Series</b>	Douglas-fir-Pine Mixed Conifer Forest, Mixed Conifer Black Oak Forest	Douglas-fir-Pine Mixed Conifer Forest, Mixed Conifer Black Oak Forest

**Soil Profile Description**

<b>Surface Soil</b>	0-13" brown heavy loam and gravelly light clay loam, moderate and weak medium granular structure, 5-35% gravel, slightly acid.	0-3" brown gravelly loam, strong medium granular structure, 20% gravel and cobbles, neutral.
<b>Subsoil</b>	13-26" light brown very gravelly clay loam, massive, 40-50% gravel, strongly acid.	3-46" light brown to reddish yellow gravelly clay loam and cobbly clay loam, moderate medium and coarse subangular blocky structure 15 to 20% gravel and cobbles, slightly acid.
<b>Substratum</b>	26-32" fractured shale.	46-50" reddish yellow extremely cobbly clay loam, strong medium subangular blocky structure, 65% gravel and cobbles, slightly acid.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	5	3-4
<b>Adapted Species Group</b>	DF, PP, SP	DF, PP, SP
<b>Soil Erodibility</b>	Moderate	Moderate
<b>AWC for Profile Depth</b>	2.0-4.5	6.0-9.7
<b>AWC for Surface 24"</b>	1.6-3.3	2.0-5.0
<b>Seedling Survival Potential</b>	Low-High	Moderate-High
<b>Plantability Potential</b>	High	High
<b>Hydrologic Soil Group</b>	B	B
<b>Potential for Roadbed Damage</b>	Moderate	High
<b>Inclusions (20%)</b>	Holland family Hugo family Neuns family	

**Remarks:**

**182 Marpa-Holland, deep families complex, 20 to 40 percent slopes**

<b>Map Unit Components</b>	<b>Marpa family (60%)</b>	<b>Holland family, deep (30%)</b>
<b>Geomorphic Position</b>	Moderately steep, dissected mountain sideslopes.	Moderately steep, toe slopes and benches.
<b>Typical Vegetation Series</b>	Douglas-fir-Pine Mixed Conifer Forest, Mixed Conifer Black Oak Forest	Douglas-fir-Pine Mixed Conifer Forest, Mixed Conifer Black Oak Forest

**Soil Profile Description**

<b>Surface Soil</b>	0-13" brown heavy loam and gravelly light clay loam, moderate and weak medium granular structure, 5-35% gravel, slightly acid.	0-3" brown gravelly loam, strong medium granular structure, 20% gravel and cobbles, neutral.
<b>Subsoil</b>	13-26" light brown very gravelly clay loam, massive, 40-50% gravel, strongly acid.	3-46" light brown to reddish yellow gravelly clay loam and cobbly clay loam, moderate medium and coarse subangular blocky structure 15 to 20% gravel and cobbles, slightly acid.
<b>Substratum</b>	26-32" fractured shale.	46-50" reddish yellow extremely cobbly clay loam, strong medium subangular blocky structure, 65% gravel and cobbles, slightly acid.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	5	3-4
<b>Adapted Species Group</b>	DF, PP, SP	DF, PP, SP
<b>Soil Erodibility</b>	Moderate	Moderate
<b>AWC for Profile Depth</b>	2.0-4.5	6.0-9.7
<b>AWC for Surface 24"</b>	1.6-3.3	2.0-5.0
<b>Seedling Survival Potential</b>	Low-High	Moderate-High
<b>Plantability Potential</b>	High	High
<b>Hydrologic Soil Group</b>	B	B
<b>Potential for Roadbed Damage</b>	Moderate	High
<b>Inclusions (10%)</b>	Holland family Hugo family Neuns family Forbes family	

Remarks:

**183 Marpa-Holland, deep families complex, 40 to 60 percent slopes**

<b>Map Unit Components</b>	<b>Marpa family (60%)</b>	<b>Holland family, deep (30%)</b>
<b>Geomorphic Position</b>	Steep, dissected mountain sideslopes.	Steep, dissected mountain sideslopes, toe slopes.
<b>Typical Vegetation Series</b>	Douglas-fir-Pine Mixed Conifer Forest	Douglas-fir-Pine Mixed Conifer Forest

**Soil Profile Description**

<b>Surface Soil</b>	0-13" brown heavy loam and gravelly light clay loam, moderate and weak medium granular structure, 5-35% gravel, slightly acid.	0-3" brown gravelly loam, strong medium granular structure, 20% gravel and cobbles, neutral.
<b>Subsoil</b>	13-26" light brown very gravelly clay loam, massive, 40-50% gravel, strongly acid.	3-46" light brown to reddish yellow gravelly clay loam and cobbly clay loam, moderate medium and coarse subangular blocky structure 15 to 20% gravel and cobbles, slightly acid.
<b>Substratum</b>	26-32" fractured shale.	46-50" reddish yellow extremely cobbly clay loam, strong medium subangular blocky structure, 65% gravel and cobbles, slightly acid.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	5	3-4
<b>Adapted Species Group</b>	DF, PP, SP	DF, PP, SP
<b>Soil Erodibility</b>	Moderate	Moderate
<b>AWC for Profile Depth</b>	2.0-4.5	6.0-9.7
<b>AWC for Surface 24"</b>	1.6-3.3	2.0-5.0
<b>Seedling Survival Potential</b>	Low-High	Moderate-High
<b>Plantability Potential</b>	Moderate	High
<b>Hydrologic Soil Group</b>	B	B
<b>Potential for Roadbed Damage</b>	Moderate	High
<b>Inclusions (10%)</b>	Holland family Neuns family Forbes family Hugo family	

**Remarks:**

**184 Marpa-Holland, deep families complex, 60 to 80 percent slopes**

Map Unit Components	<b>Marpa family (60%)</b>	<b>Holland family, deep (30%)</b>
Geomorphic Position	Very steep, dissected mountain sideslopes.	Very steep, dissected mountain sideslopes.
Typical Vegetation Series	Douglas-fir-Pine Mixed Conifer Forest	Douglas-fir-Pine Mixed Conifer Forest

**Soil Profile Description**

Surface Soil	0-13" brown heavy loam and gravelly light clay loam, moderate and weak medium granular structure, 5-35% gravel, slightly acid.	0-3" brown gravelly loam, strong medium granular structure, 20% gravel and cobbles, neutral.
Subsoil	13-26" light brown very gravelly clay loam, massive, 40-50% gravel, strongly acid.	3-46" light brown to reddish yellow gravelly clay loam and cobbly clay loam, moderate medium and coarse subangular blocky structure 15 to 20% gravel and cobbles, slightly acid.
Substratum	26-32" fractured shale.	46-50" reddish yellow extremely cobbly clay loam, strong medium subangular blocky structure, 65% gravel and cobbles, slightly acid.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	5	3-4
Adapted Species Group	DF, PP, SP	DF, PP, SP
Soil Erodibility	Moderate	Moderate
AWC for Profile Depth	2.0-4.5	6.0-9.7
AWC for Surface 24"	1.6-3.3	2.0-5.0
Seedling Survival Potential	Low-High	Moderate-High
Plantability Potential	Moderate	High
Hydrologic Soil Group	B	B
Potential for Roadbed Damage	Moderate	High
Inclusions (10%)	Holland family Neuns family Deadwood family Hugo family	

Remarks:

**185 Marpa family-Marpa family, deep complex, 40 to 60 percent slopes**

Map Unit Components	<b>Marpa family (50%)</b>	<b>Marpa family, deep (30%)</b>
Geomorphic Position	Steep dissected mountain sideslopes.	Steep dissected mountain sideslopes.
Typical Vegetation Series	Douglas-fir-Pine Mixed Conifer Forest	Douglas-fir-Pine Mixed Conifer Forest

**Soil Profile Description**

Surface Soil	0-13" brown heavy loam and gravelly light clay loam, moderate and weak medium granular structure, 5-35% gravel, slightly acid.	0-6" very pale brown gravelly loam, moderate medium granular structure, 27% gravel, slightly acid.
Subsoil	13-26" light brown very gravelly clay loam, massive, 40-50% gravel, strongly acid.	6-72" light yellowish brown to yellow very gravelly clay loam, moderate fine and medium subangular blocky structure, 15 to 20% gravel and cobbles, slightly acid.
Substratum	26-32" fractured shale.	Metamorphic rock at greater than 40" depth.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	5	4
Adapted Species Group	DF, PP, SP	DF, PP, SP
Soil Erodibility	Moderate	Low
AWC for Profile Depth	2.0-4.5	5.7-8.5
AWC for Surface 24"	1.6-3.3	2.3-3.0
Seedling Survival Potential	Low-High	Moderate
Plantability Potential	Moderate	Moderate
Hydrologic Soil Group	B	B
Potential for Roadbed Damage	Moderate	Moderate
Inclusions (20%)	Neuns family Neuns family, deep Deadwood family	

Remarks:

**186 Marpa-Neuns families, 20 to 40 percent slopes**

<b>Map Unit Components</b>	<b>Marpa family (50%)</b>	<b>Neuns family (25%)</b>
<b>Geomorphic Position</b>	Moderately steep, dissected broken mountain sideslopes, toe slopes, benches.	Moderately steep, dissected mountain sideslopes.
<b>Typical Vegetation Series</b>	Douglas-fir-Pine Mixed Conifer Forest, Mixed Conifer-Black Oak Forest	Douglas-fir-Pine Mixed Conifer Forest, Mixed Conifer-Black Oak Forest

**Soil Profile Description**

<b>Surface Soil</b>	0-13" brown heavy loam and gravelly light clay loam, moderate and weak medium granular structure, 5-35% gravel, slightly acid.	0-11" brown to light brown very gravelly sandy loam, weak to moderate medium granular structure, 35-45% gravel, slightly acid.
<b>Subsoil</b>	13-26" light brown very gravelly clay loam, massive, 40-50% gravel, strongly acid.	11-23" light brown very gravelly sandy loam, moderate fine subangular blocky structure, 55% gravel and cobbles, slightly acid.
<b>Substratum</b>	26-32" fractured shale.	23-34" highly fractured, slightly weathered metamorphic rock.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	5	5
<b>Adapted Species Group</b>	DF, PP, SP	DF, PP, SP
<b>Soil Erodibility</b>	Moderate	Low
<b>AWC for Profile Depth</b>	2.0-4.5	2.3-4.8
<b>AWC for Surface 24"</b>	1.6-3.3	1.6-3.2
<b>Seedling Survival Potential</b>	Low-High	Low-High
<b>Plantability Potential</b>	High-Moderate	High-Moderate
<b>Hydrologic Soil Group</b>	B	B
<b>Potential for Roadbed Damage</b>	Moderate	Moderate
<b>Inclusions (25%)</b>	Deadwood family Holland family Neuns family, deep Holland family, deep	

**Remarks:**

**187 Marpa-Neuns families, 40 to 60 percent slopes**

Map Unit Components	<b>Marpa family (60%)</b>	<b>Neuns family (30%)</b>
Geomorphic Position	Steep, dissected mountain sideslopes.	Steep, dissected mountain sideslopes.
Typical Vegetation Series	Douglas-fir-Pine Mixed Conifer Forest, Mixed Conifer-Black Oak Forest	Douglas-fir-Pine Mixed Conifer Forest, Mixed Conifer-Black Oak Forest

**Soil Profile Description**

Surface Soil	0-13" brown heavy loam and gravelly light clay loam, moderate and weak medium granular structure, 5-35% gravel, slightly acid.	0-11" brown to light brown very gravelly sandy loam, weak to moderate medium granular structure, 35-45% gravel, slightly acid.
Subsoil	13-26" light brown very gravelly clay loam, massive, 40-50% gravel, strongly acid.	11-23" light brown very gravelly sandy loam, moderate fine subangular blocky structure, 55% gravel and cobbles, slightly acid.
Substratum	26-32" fractured shale.	23-34" highly fractured, slightly weathered metamorphic rock.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	5	5
Adapted Species Group	DF, PP, SP	DF, PP, SP
Soil Erodibility	Moderate	Low
AWC for Profile Depth	2.0-4.5	2.3-4.8
AWC for Surface 24"	1.6-3.3	1.6-3.2
Seedling Survival Potential	Low-High	Low-High
Plantability Potential	Moderate	Moderate
Hydrologic Soil Group	B	B
Potential for Roadbed Damage	Moderate	Moderate
Inclusions (25%)	Deadwood family Holland family Neuns family, deep Neuns family, schist substratum	

Remarks:

**188 Marpa-Neuns families, 60 to 80 percent slopes**

Map Unit Components	<b>Marpa family (60%)</b>	<b>Neuns family (30%)</b>
Geomorphic Position	Very steep, dissected mountain sideslopes.	Very steep, dissected mountain sideslopes.
Typical Vegetation Series	Douglas-fir-Pine Mixed Conifer Forest, Mixed Conifer-Black Oak Forest	Douglas-fir-Pine Mixed Conifer Forest, Mixed Conifer-Black Oak Forest

**Soil Profile Description**

Surface Soil	0-13" brown heavy loam and gravelly light clay loam, moderate and weak medium granular structure, 5-35% gravel, slightly acid.	0-11" brown to light brown very gravelly sandy loam, weak to moderate medium granular structure, 35-45% gravel, slightly acid.
Subsoil	13-26" light brown very gravelly clay loam, massive, 40-50% gravel, strongly acid.	11-23" light brown very gravelly sandy loam, moderate fine subangular blocky structure, 55% gravel and cobbles, slightly acid.
Substratum	26-32" fractured shale.	23-34" highly fractured, slightly weathered metamorphic rock.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	5	5
Adapted Species Group	DF, PP, SP	DF, PP, SP
Soil Erodibility	Moderate	Low
AWC for Profile Depth	2.0-4.5	2.3-4.8
AWC for Surface 24"	1.6-3.3	1.6-3.2
Seedling Survival Potential	Low-High	Low-High
Plantability Potential	Low	Low
Hydrologic Soil Group	B	B
Potential for Roadbed Damage	Moderate	Moderate
Inclusions (10%)	Deadwood family Rubble land	
Remarks:		

**189 Marpa family, deep, 40 to 60 percent slopes**

Map Unit Components	<b>Marpa family, deep (25%)</b>
Geomorphic Position	Steep mountain sideslopes.
Typical Vegetation Series	Douglas-fir-Pine Mixed Conifer Forest

**Soil Profile Description**

Surface Soil	0-6" very pale brown gravelly loam, moderate medium granular structure, 27% gravel, slightly acid.
Subsoil	6-72" light yellowish brown to yellow very gravelly clay loam, moderate fine and medium subangular blocky structure, 15 to 20% gravel and cobbles, slightly acid.
Substratum	Metamorphic rock at greater than 70" depth.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	4
Adapted Species Group	DF, PP, SP
Soil Erodibility	Low
AWC for Profile Depth	5.7-8.5
AWC for Surface 24"	2.3-3.0
Seedling Survival Potential	Moderate
Plantability Potential	Moderate-High
Hydrologic Soil Group	B
Potential for Roadbed Damage	Moderate
Inclusions (25%)	Neuns family, deep Marpa family
Remarks:	

**190 Marpa, deep-Deadwood families association, 40 to 60 percent slopes**

Map Unit Components	<b>Marpa family, deep (50%)</b>	<b>Deadwood family (30%)</b>
Geomorphic Position	Steep mountain sideslopes.	Steep upper mountain sideslopes and ridge tops.
Typical Vegetation Series	Douglas-fir-Pine Mixed Conifer Forest	Canyon Oak Woodland Mixed Conifer - Canyon Oak Woodland

**Soil Profile Description**

Surface Soil	0-6" very pale brown gravelly loam, moderate medium granular structure, 27% gravel, slightly acid.	0-3" dark brown very gravelly, sandy loam, weak fine granular structure, 55% gravel, neutral.
Subsoil	6-72" light yellowish brown to yellow very gravelly clay loam, moderate fine and medium subangular blocky structure, 15 to 20% gravel and cobbles, slightly acid.	3-15" yellowish brown and light brown very gravelly loam and extremely cobbly heavy loam, weak fine and medium subangular blocky structure, 55 to 65% gravel and cobbles, slightly to medium acid.
Substratum	Metamorphic rock at greater than 70" depth.	15-17" metamorphosed shale, moderately fractured, slightly weathered.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	4	6-7
Adapted Species Group	DF, PP, SP	DF, PP, SP, BL
Soil Erodibility	Low	Low
AWC for Profile Depth	5.7-8.5	0.9-1.5
AWC for Surface 24"	2.3-3.0	0.9-1.5
Seedling Survival Potential	Moderate	V. Low-Low
Plantability Potential	Moderate-High	V. Low-Low
Hydrologic Soil Group	B	C
Potential for Roadbed Damage	Moderate	Low
Inclusions (20%)	Neuns family Neuns family, deep Marpa family	

Remarks:

**191 McCumber family, 0 to 35 percent slopes**

Map Unit Components	<b>McCumber family (75%)</b>
Geomorphic Position	Moderately sloping moraines.
Typical Vegetation Series	Mixed Conifer Fir Forest

**Soil Profile Description**

Surface Soil	0-11" grayish brown and dark grayish brown coarse sandy loam, weak very fine subangular blocky structure, 5% gravel, medium to slightly acid.
Subsoil	11-17" brown cobbly coarse sandy loam, weak fine subangular blocky and granular structure, 25% cobbles and gravel, slightly acid.
Substratum	17-43" brown and pale brown very cobbly and gravelly loamy sand, weak medium subangular blocky structure, 45% gravel and cobbles, slightly acid. 43-45" compacted glacial till.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	4
Adapted Species Group	WF, RF, JP
Soil Erodibility	Moderate
AWC for Profile Depth	1.2-2.5
AWC for Surface 24"	0.7-1.6
Seedling Survival Potential	V. Low-Moderate
Plantability Potential	Moderate-High
Hydrologic Soil Group	A
Potential for Roadbed Damage	Moderate
Inclusions (25%)	Revit family
Remarks:	

**192 McCumber-Revit families complex, 40 to 60 percent slopes**

<b>Map Unit Components</b>	<b>McCumber family (60%)</b>	<b>Revit family (30%)</b>
<b>Geomorphic Position</b>	Steep volcanic sideslopes, outwash channels glacial moraines.	Steep volcanic sideslopes, and outwash slopes.
<b>Typical Vegetation Series</b>	Upper Montane Mixed Chaparral Red Fir - White Fir Forest Upper Montane Mixed Coniferous Forest	Upper Montane Mixed Chaparral Red Fir - White Forest

**Soil Profile Description**

<b>Surface Soil</b>	0-11" grayish brown and dark grayish brown coarse sandy loam, weak very fine subangular blocky structure, 5% gravel, medium to slightly acid.	0-20" very dark grayish brown loamy sand to dark grayish weak fine granular to weak medium subangular blocky structure, 0-14% gravel, strongly to medium acid.
<b>Subsoil</b>	11-17" brown cobbly coarse sandy loam, weak fine subangular blocky and granular structure, 25% cobbles and gravel, slightly acid.	20-36" brown cobbly loamy fine sand, weak medium subangular blocky structure, 30-35% gravel, medium to strongly acid.
<b>Substratum</b>	17-43" brown and pale brown very cobbly and gravelly loamy sand, weak medium subangular blocky structure, 45% gravel and cobbles, slightly acid. 43-45" compacted glacial till.	36-40" fractured vesicular basalt.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	4	4
<b>Adapted Species Group</b>	WF, RF, JP	WF, RF, JP
<b>Soil Erodibility</b>	Moderate	Low
<b>AWC for Profile Depth</b>	1.2-2.5	3.2-5.2
<b>AWC for Surface 24"</b>	0.7-1.6	2.4-2.8
<b>Seedling Survival Potential</b>	V. Low-Moderate	Moderate
<b>Plantability Potential</b>	Moderate-High	Moderate-High
<b>Hydrologic Soil Group</b>	A	B
<b>Potential for Roadbed Damage</b>	Moderate	High
<b>Inclusions (10%)</b>	Rock outcrop, volcanic Sheld family	
<b>Remarks:</b>	Most units have frequent surface boulders, slight limitation for site preparation equipment.	

**193 Merkel-Toadlake-Parks families complex, 5 to 40 percent slopes**

Map Unit Components	<b>Merkel family (40%)</b>	<b>Toadlake family (20%)</b>	<b>Parks family (20%)</b>
Geomorphic Position	Gentle to moderately steep, linear to broken ground moraines.	Similar position as Merkel family.	Similar position as Merkel family.
Typical Vegetation Series	Jeffrey Pine Mixed Conifer Forest, Mixed Upper Montane Coniferous Forest	Jeffrey Pine - Incense Cedar Woodland, Jeffrey Pine Mixed Conifer Forest	Similar vegetation as Toadlake family

**Soil Profile Description**

Surface Soil	0-9" reddish brown very stony sandy loam, moderate very fine granular structure, 50% stones and gravel, slightly acid.	0-10" grayish brown and light gray very gravelly loam, moderate very fine granular and very fine subangular blocky structure, 35-45% gravel and cobbles, slightly acid to neutral.	0-13" yellowish red gravelly and very gravelly sandy clay loam, moderate very fine granular structure, 40-50% gravel and cobbles, neutral.
Subsoil	9-29" strong brown stony loam and brownish yellow very stony sandy loam, weak to moderate medium subangular blocky structure, 35-45% stones and gravel, neutral.	10-56" light brownish gray very gravelly sandy clay loam to light yellowish brown very gravelly clay loam, moderate fine to weak coarse subangular blocky structure, 45-50% gravel and cobbles, mildly alkaline.	13-24" strong brown very gravelly sandy clay loam, moderate medium and fine subangular blocky structure, 40% gravel and cobbles, neutral.
Substratum	29-49" compacted cobbly and stony glacial till.	56-59" hard, moderately fractured ultramafic rock.	24-44" strong brown and reddish yellow very gravelly heavy sandy loam, massive to weak fine and medium subangular blocky structure, 40-50% gravel and cobbles, neutral to mildly alkaline. 44-62" highly fractured and weathered ultramafic rock.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	5-7	5	5-6
Adapted Species Group	JP, WWP, WF, LPP	JP, WPP, WF	JP, WWF, WF
Soil Erodibility	Low	Moderate	Low
AWC for Profile Depth	2.8-4.0	3.0-5.0	2.3-5.2
AWC for Surface 24"	1.9-3.0	2.0-3.0	1.9-2.6
Seedling Survival Potential	Low	Moderate	Low-Moderate
Plantability Potential	Low-V. Low	Low-V. Low	Low-V. Low
Hydrologic Soil Group	B-C	B	B
Potential for Roadbed Damage	Low	Moderate	Moderate
Inclusions 20%	Glacial till, ultramafic Konocti family		
Remarks:	Toadlake and Parks limitations: Ca/Mg imbalance limits species and productivity.		

**194 Merkel-Wintoner families complex, 50 to 80 percent slopes**

<b>Map Unit Components</b>	<b>Merkel family (50%)</b>	<b>Wintoner family (30%)</b>
<b>Geomorphic Position</b>	Steep to very steep dissected, linear mountain sideslopes.	Similar position as Merkel family.
<b>Typical Vegetation Series</b>	Mixed Conifer-Fir Forest, White Fir Forest	Similar vegetation as Merkel family

**Soil Profile Description**

<b>Surface Soil</b>	0-9" reddish brown very stony sandy loam, moderate very fine granular structure, 50% stones and gravel, slightly acid.	0-11" dark brown gravelly sandy loam and brown gravelly loam, moderate fine granular and weak fine subangular blocky structure, 15-25% gravel and cobbles, medium to slightly acid.
<b>Subsoil</b>	9-29" strong brown stony loam and brownish yellow very stony sandy loam, weak to moderate medium subangular blocky structure, 35-45% stones and gravel, neutral.	11-30" brownish yellow and gravelly loam, weak medium and coarse subangular blocky structure, 15-30% gravel and cobbles, strongly acid.
<b>Substratum</b>	29-49" compacted cobbly and stony glacial till.	30-45" brownish yellow very gravelly sandy clay loam, relict rock structure, 40% gravel, strongly acid. 45-53" highly weathered basic intrusive rock.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	4-5	4-5
<b>Adapted Species Group</b>	JP, WWP, WF	WF, JP, SP, DF
<b>Soil Erodibility</b>	Low	Low
<b>AWC for Profile Depth</b>	3.0-4.0	2.9-3.6
<b>AWC for Surface 24"</b>	1.9-3.0	2.9-3.6
<b>Seedling Survival Potential</b>	Low-Moderate	Moderate-High
<b>Plantability Potential</b>	High-Low	High-Low
<b>Hydrologic Soil Group</b>	B	B
<b>Potential for Roadbed Damage</b>	Moderate	Moderate
<b>Inclusions (20%)</b>	Nanny family Skymor family	
<b>Remarks:</b>	Ca/Mg imbalance, may limit species and growth on soil from ultramafics.	

**195 Millsholm family, 20 to 60 percent slopes**

Map Unit Components	<b>Millsholm family (75%)</b>
Geomorphic Position	Moderately steep to steep dissected mountain sideslopes.
Typical Vegetation Series	Blue Oak Woodland, Low Montane & Foothill Mixed Chaparral

**Soil Profile Description**

Surface Soil	0-3" pale brown gravelly loam, moderate fine granular structure, 20% gravel, slightly acid.
Subsoil	3-12" light gray and pinkish gray gravelly loam, moderate coarse and weak medium subangular blocky structure, 20-50% gravel and cobbles, slightly acid.
Substratum	12" highly fractured, slightly weathered sedimentary rock.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	7
Adapted Species Group	BL
Soil Erodibility	Moderate
AWC for Profile Depth	1.2-2.9
AWC for Surface 24"	1.2-2.8
Seedling Survival Potential	Low-Moderate
Plantability Potential	V. Low-Low
Hydrologic Soil Group	D
Potential for Roadbed Damage	Low
Inclusions (25%)	Goulding family Rock outcrop, metamorphic Soils similar to Millsholm family with dark surface horizon Soils similar to Millsholm family with argillic horizon

Remarks:

**196 Morical family, 0 to 10 percent slopes**

Map Unit Components	<b>Morical family (80%)</b>
Geomorphic Position	Outwash terraces, alluvial flats.
Typical Vegetation Series	Upper Montane Dry Meadows

**Soil Profile Description**

Surface Soil	0-6" dark brown sandy clay loam, weak medium subangular blocky structure, 10% gravel, medium acid.
Subsoil	6-27" dark yellowish brown and strong brown sandy clay loam, strong medium and coarse subangular blocky structure, 15% gravel, neutral.
Substratum	27-44" strong brown sandy clay loam, moderate medium and coarse subangular blocky structure, 5% gravel, neutral.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	5
Adapted Species Group	P, BL, GL, LPP
Soil Erodibility	High
AWC for Profile Depth	6.5-7.8
AWC for Surface 24"	3.0-4.3
Seedling Survival Potential	High
Plantability Potential	High
Hydrologic Soil Group	D
Potential for Roadbed Damage	High
Inclusions (20%)	Oval family, ponded Germany family, deep
Remarks:	This family includes a poorly drained phase, a somewhat poorly drained phase and a well drained phase. High water table creates severe limitations for artificial regeneration.

**197 Nanny family-Lithic Xerumbrepts association, 30 to 70 percent slopes**

<b>Map Unit Components</b>	<b>Nanny family (45%)</b>	<b>Lithic Xerumbrepts (30%)</b>
<b>Geomorphic Position</b>	Lower slopes of dissected steep to very steep, linear, mountain sideslopes and lateral moraines.	Similar to that described for Nanny.
<b>Typical Vegetation Series</b>	Mixed Upper Montane Coniferous Forest, White Fir Forest	Upper Montane Mixed Chaparral

**Soil Profile Description**

<b>Surface Soil</b>	0-13" black very cobbly fine sandy loam, moderate very fine granular structure 55% gravel and cobbles, medium acid.	0-12" very dark grayish brown very cobbly fine sandy loam and dark yellowish brown cobbly loamy sand, moderate very fine granular and weak medium subangular blocky structure, 30-40% cobbles and gravel, medium to very strongly acid.
<b>Subsoil</b>	13-29" yellowish brown extremely gravelly sandy loam, weak fine subangular blocky structure, 70% gravel and cobbles, slightly acid.	
<b>Substratum</b>	29-48" pale brown extremely cobbly loamy sand, single grain, 70-80% gravel and cobbles, slightly acid. 48-60" gravel and cobbles with sand in voids.	12-19" yellowish brown very cobbly loamy sand, single grain, 55% gravel and cobbles, medium acid. 19-21" moderately weathered and fractured quartz monzonite.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	5	6-7
<b>Adapted Species Group</b>	WF, JP, SP	BL, WF, JP, SP
<b>Soil Erodibility</b>	Low	Low
<b>AWC for Profile Depth</b>	2.0-3.5	0.5-1.5
<b>AWC for Surface 24"</b>	1.4-2.4	0.6-1.4
<b>Seedling Survival Potential</b>	Low-Moderate	V. Low-Low
<b>Plantability Potential</b>	High-Low	Low
<b>Hydrologic Soil Group</b>	A	B-C
<b>Potential for Roadbed Damage</b>	Moderate	Moderate
<b>Inclusions (25%)</b>	Jayar family, deep Rock outcrop Rogue family	

Remarks:

**198 Nanny family-Rock outcrop-Rubble land complex, 30 to 70 percent slopes**

Map Unit Components	<b>Nanny family (45%)</b>	<b>Rock outcrop (25%)</b>	<b>Rubble land (20%)</b>
Geomorphic Position	Steep to very steep, linear ridge tops and cirques.	Similar position as Nanny family, but most common on ridges.	Similar position as Nanny family, but most common on ridges.
Typical Vegetation Series	White Fir Forest Upper Montane Mixed Chaparral		Rock Outcrop Rubble and Tallus

**Soil Profile Description**

Surface Soil	0-13" black very cobbly fine sandy loam, moderate very fine granular structure 55% gravel and cobbles, medium acid.		
Subsoil	13-29" yellowish brown extremely gravelly sandy loam, weak fine subangular blocky structure, 70% gravel and cobbles, slightly acid.		
Substratum	29-48" pale brown extremely cobbly loamy sand, single grain, 70-80% gravel and cobbles, slightly acid. 48-60" gravel and cobbles with sand in voids.	Granitic rock outcrop.	Granitic tallus.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	5		
Adapted Species Group	WF, JP, SP		
Soil Erodibility	Low		
AWC for Profile Depth	2.0-3.5		
AWC for Surface 24"	1.4-2.4		
Seedling Survival Potential	Low-Moderate		
Plantability Potential	V. Low		
Hydrologic Soil Group	A	D	D
Potential for Roadbed Damage	Moderate	Low	Low
Inclusions (15%)	Lithic Xerumbrepts Rogue family		
Remarks:			

**199 Neer family, 20 to 40 percent slopes**

Map Unit Components	<b>Neer family (80%)</b>
Geomorphic Position	Moderate steep ridge top slopes.
Typical Vegetation Series	White Fir Forest Ponderosa Pine Forest, Upper Montane Mixed Chaparral

**Soil Profile Description**

Surface Soil	0-9" dark brown to yellowish brown gravelly sandy loam, moderate fine granular to weak medium subangular blocky structure, 30% gravel, medium acid.
Subsoil	9-26" light yellowish brown gravelly and very gravelly sandy loam, weak medium subangular blocky structure, 35-40% gravel, medium acid.
Substratum	26-35" extrusive igneous rock, paralithic contact.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	5
Adapted Species Group	PP
Soil Erodibility	Low
AWC for Profile Depth	1.6-3.6
AWC for Surface 24"	1.4-2.1
Seedling Survival Potential	Low-Moderate
Plantability Potential	Low
Hydrologic Soil Group	B
Potential for Roadbed Damage	Low
Inclusions (20%)	Sadie family Rock outcrop, volcanic
Remarks:	Includes Neer family, cobbly phases and shallower phase (22-24") with reduced regeneration potential.

**200 Neer family, 40 to 60 percent slopes**

Map Unit Components	<b>Neer family (80%)</b>
Geomorphic Position	Ridge tops and steep mountain sideslopes.
Typical Vegetation Series	White Fir Forest Ponderosa Pine Forest, Upper Montane Mixed Chaparral

**Soil Profile Description**

Surface Soil	0-9" dark brown to yellowish brown gravelly sandy loam, moderate fine granular to weak medium subangular blocky structure, 30% gravel, medium acid.
Subsoil	9-26" light yellowish brown gravelly and very gravelly sandy loam, weak medium subangular blocky structure, 35-40% gravel, medium acid.
Substratum	26-35" extrusive igneous rock, paralithic contact.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	5
Adapted Species Group	PP
Soil Erodibility	Low
AWC for Profile Depth	1.6-3.6
AWC for Surface 24"	1.4-2.1
Seedling Survival Potential	Low-Moderate
Plantability Potential	Low
Hydrologic Soil Group	B
Potential for Roadbed Damage	Low
Inclusions (20%)	Rock outcrop, volcanic Sadie family
Remarks:	Includes Neer cobbly phase and shallower phase (22-24") with reduced regenerability potential, frequent surface boulders have moderate limitation for heavy equipment.

**201 Neer-Sadie families association, 20 to 40 percent slopes**

Map Unit Components	<b>Neer family (60%)</b>	<b>Sadie family (30%)</b>
Geomorphic Position	Moderately steep sideslopes and ridge tops.	Gently sloping volcanic sideslopes.
Typical Vegetation Series	White Fir Forest Ponderosa Pine Forest, Snowbrush Chaparral	White Fir Forest Ponderosa Pine Forest, Snowbrush Chaparral

**Soil Profile Description**

Surface Soil	0-9" dark brown to yellowish brown gravelly sandy loam, moderate fine granular to weak medium subangular blocky structure, 30% gravel, medium acid.	0-5" brown sandy loam, weak medium granular structure, 10% gravel, neutral.
Subsoil	9-26" light yellowish brown gravelly and very gravelly sandy loam, weak medium subangular blocky structure, 35-40% gravel, medium acid.	5-36" brown sandy loam, fine sandy loam and gravelly fine sandy loam, weak medium subangular blocky structure, 10-25% gravel and cobbles, neutral.
Substratum	26-35" extrusive igneous rock, paralithic contact.	36-38" basalt bedrock.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	5	4
Adapted Species Group	PP	PP, WF, JP, SP
Soil Erodibility	Low	Moderate
AWC for Profile Depth	1.6-3.6	3.4-5.5
AWC for Surface 24"	1.4-2.1	2.2-3.0
Seedling Survival Potential	Low-Moderate	Moderate
Plantability Potential	Low	Moderate-High
Hydrologic Soil Group	B	B
Potential for Roadbed Damage	Low	High

Inclusions (10%) Germany family, deep

Remarks: Most units have frequent surface boulders, slight limitation for heavy equipment.

## 202 Neuns family, 20 to 40 percent slopes

Map Unit Components	<b>Neuns family (75%)</b>
Geomorphic Position	Moderately steep, dissected mountain sideslopes.
Typical Vegetation Series	Douglas-fir-Pine Mixed Conifer Forest, Mixed Conifer-Fir Forest

### Soil Profile Description

Surface Soil	0-11" brown to light brown very gravelly sandy loam, weak to moderate medium granular structure, 35-45% gravel, slightly acid.
Subsoil	11-23" light brown very gravelly sandy loam, moderate fine subangular blocky structure, 55% gravel and cobbles, slightly acid.
Substratum	23-34" highly fractured, slightly weathered metamorphic rock.

### Soil Properties & Management Interpretations

Forest Survey Site Class	5
Adapted Species Group	DF, PP, SP
Soil Erodibility	Low
AWC for Profile Depth	2.3-4.8
AWC for Surface 24"	1.6-3.2
Seedling Survival Potential	Low-Moderate
Plantability Potential	Moderate-Low
Hydrologic Soil Group	B
Potential for Roadbed Damage	Moderate
Inclusions (25%)	Hugo, moderately deep family Holland, deep family Deadwood family Hugo family

Remarks:

## 203 Neuns family, 40 to 60 percent slopes

Map Unit Components	<b>Neuns family (75%)</b>
Geomorphic Position	Steep, dissected linear, mountain sideslopes.
Typical Vegetation Series	Douglas-fir-Pine Mixed Conifer Forest, Mixed Conifer-Fir Forest

### Soil Profile Description

Surface Soil	0-11" brown to light brown very gravelly sandy loam, weak to moderate medium granular structure, 35-45% gravel, slightly acid.
Subsoil	11-23" light brown very gravelly sandy loam, moderate fine subangular blocky structure, 55% gravel and cobbles, slightly acid.
Substratum	23-34" highly fractured, slightly weathered metamorphic rock.

### Soil Properties & Management Interpretations

Forest Survey Site Class	5
Adapted Species Group	DF, PP, SP
Soil Erodibility	Low
AWC for Profile Depth	2.3-4.8
AWC for Surface 24"	1.6-3.2
Seedling Survival Potential	Low-Moderate
Plantability Potential	Moderate-High
Hydrologic Soil Group	B
Potential for Roadbed Damage	Moderate
Inclusions (25%)	Hugo, moderately deep family Neuns, deep family Deadwood family Rock outcrop, metamorphic

Remarks:

## 204 Neuns family, 60 to 80 percent slopes

Map Unit Components	<b>Neuns family (75%)</b>
Geomorphic Position	Very steep, dissected mountain sideslopes.
Typical Vegetation Series	Douglas-fir-Pine Mixed Conifer Forest, Mixed Conifer-Fir Forest Douglas-Fir-Canyon Oak

### Soil Profile Description

Surface Soil	0-11" brown to light brown very gravelly sandy loam, weak to moderate medium granular structure, 35-45% gravel, slightly acid.
Subsoil	11-23" light brown very gravelly sandy loam, moderate fine subangular blocky structure, 55% gravel and cobbles, slightly acid.
Substratum	23-34" highly fractured, slightly weathered metamorphic rock.

### Soil Properties & Management Interpretations

Forest Survey Site Class	5
Adapted Species Group	DF, PP, SP
Soil Erodibility	Low
AWC for Profile Depth	2.3-4.8
AWC for Surface 24"	1.6-3.2
Seedling Survival Potential	Low-Moderate
Plantability Potential	Low
Hydrologic Soil Group	B
Potential for Roadbed Damage	Moderate
Inclusions (25%)	Typic Xerorthents Hugo, moderately deep family Deadwood family Rock outcrop, metamorphic

Remarks:

**205 Neuns-Deadwood families complex, 20 to 40 percent slopes**

<b>Map Unit Components</b>	<b>Neuns family (60%)</b>	<b>Deadwood family (30%)</b>
<b>Geomorphic Position</b>	Moderately steep, dissected mountain sideslopes.	Moderately steep, dissected mountain sideslopes.
<b>Typical Vegetation Series</b>	Douglas-fir-Pine Mixed Conifer Forest	Mixed Conifer-Canyon Oak Forest

**Soil Profile Description**

<b>Surface Soil</b>	0-11" brown to light brown very gravelly sandy loam, weak to moderate medium granular structure, 35-45% gravel, slightly acid.	0-3" dark brown very gravelly, sandy loam, weak fine granular structure, 55% gravel, neutral.
<b>Subsoil</b>	11-23" light brown very gravelly sandy loam, moderate fine subangular blocky structure, 55% gravel and cobbles, slightly acid.	3-15" yellowish brown and light brown very gravelly loam and extremely cobbly heavy loam, weak fine and medium subangular blocky structure, 55 to 65% gravel and cobbles, slightly to medium acid.
<b>Substratum</b>	23-34" highly fractured, slightly weathered metamorphic rock.	15-17" metamorphosed shale, moderately fractured, slightly weathered.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	5	6-7
<b>Adapted Species Group</b>	DF, PP, SP	DF, PP, SP, BL
<b>Soil Erodibility</b>	Low	Low
<b>AWC for Profile Depth</b>	2.3-4.8	0.9-1.5
<b>AWC for Surface 24"</b>	1.6-3.2	0.9-1.5
<b>Seedling Survival Potential</b>	Low-Moderate	V.Low-Low
<b>Plantability Potential</b>	High-Moderate	V. Low-Low
<b>Hydrologic Soil Group</b>	B	C
<b>Potential for Roadbed Damage</b>	Moderate	Low
<b>Inclusions (10%)</b>	Neuns, deep family Marpa family	

**Remarks:**

**206 Neuns-Deadwood families complex, 40 to 60 percent slopes**

<b>Map Unit Components</b>	<b>Neuns family (50%)</b>	<b>Deadwood family (25%)</b>
<b>Geomorphic Position</b>	Steep, dissected, linear, mountain sideslopes.	Steep, dissected, linear, mountain sideslopes.
<b>Typical Vegetation Series</b>	Douglas-fir-Pine Mixed Conifer Forest	Mixed Conifer-Canyon Oak Forest

**Soil Profile Description**

<b>Surface Soil</b>	0-11" brown to light brown very gravelly sandy loam, weak to moderate medium granular structure, 35-45% gravel, slightly acid.	0-3" dark brown very gravelly, sandy loam, weak fine granular structure, 55% gravel, neutral.
<b>Subsoil</b>	11-23" light brown very gravelly sandy loam, moderate fine subangular blocky structure, 55% gravel and cobbles, slightly acid.	3-15" yellowish brown and light brown very gravelly loam and extremely cobbly heavy loam, weak fine and medium subangular blocky structure, 55 to 65% gravel and cobbles, slightly to medium acid.
<b>Substratum</b>	23-34" highly fractured, slightly weathered metamorphic rock.	15-17" metamorphosed shale, moderately fractured, slightly weathered.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	5	6-7
<b>Adapted Species Group</b>	DF, PP, SP	DF, PP, SP, BL
<b>Soil Erodibility</b>	Low	Low
<b>AWC for Profile Depth</b>	2.3-4.8	0.9-1.5
<b>AWC for Surface 24"</b>	1.6-3.2	0.9-1.5
<b>Seedling Survival Potential</b>	Low-Moderate	V.Low-Low
<b>Plantability Potential</b>	Moderate-High	
<b>Hydrologic Soil Group</b>	B	C
<b>Potential for Roadbed Damage</b>	Moderate	Low
<b>Inclusions (25%)</b>	Neuns, deep family Marpa family	
<b>Remarks:</b>	Deadwood family includes eroded phases of Neuns Series.	

**207 Neuns-Deadwood families complex, 60 to 80 percent slopes**

<b>Map Unit Components</b>	<b>Neuns family (50%)</b>	<b>Deadwood family (30%)</b>
<b>Geomorphic Position</b>	Very steep, highly dissected linear mountain sideslopes.	Very steep, highly dissected, linear, mountain sideslopes.
<b>Typical Vegetation Series</b>	Douglas-fir-Pine Mixed Conifer Forest	Mixed Conifer-Canyon Oak Forest

**Soil Profile Description**

<b>Surface Soil</b>	0-11" brown to light brown very gravelly sandy loam, weak to moderate medium granular structure, 35-45% gravel, slightly acid.	0-3" dark brown very gravelly, sandy loam, weak fine granular structure, 55% gravel, neutral.
<b>Subsoil</b>	11-23" light brown very gravelly sandy loam, moderate fine subangular blocky structure, 55% gravel and cobbles, slightly acid.	3-15" yellowish brown and light brown very gravelly loam and extremely cobbly heavy loam, weak fine and medium subangular blocky structure, 55 to 65% gravel and cobbles, slightly to medium acid.
<b>Substratum</b>	23-34" highly fractured, slightly weathered metamorphic rock.	15-17" metamorphosed shale, moderately fractured, slightly weathered.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	5	6-7
<b>Adapted Species Group</b>	DF, PP, SP	DF, PP, SP, BL
<b>Soil Erodibility</b>	Low	Low
<b>AWC for Profile Depth</b>	2.3-4.8	0.9-1.5
<b>AWC for Surface 24"</b>	1.6-3.2	0.9-1.5
<b>Seedling Survival Potential</b>	Low-Moderate	V.Low-Low
<b>Plantability Potential</b>	Low	Low
<b>Hydrologic Soil Group</b>	B	C
<b>Potential for Roadbed Damage</b>	Moderate	Low

**Inclusions (20%)**  
 Typic Xerorthents  
 Rock outcrop, metamorphic  
 Rubble land

**Remarks:** Deadwood family includes eroded phases of Neuns.

**208 Neuns-Goulding families association, 40 to 60 percent slopes**

Map Unit Components	<b>Neuns family (50%)</b>	<b>Goulding family (30%)</b>
Geomorphic Position	Steep, linear, mountain sideslopes.	Ridge tops and steep, linear, dissected mountain sideslopes.
Typical Vegetation Series	Douglas-fir Pine Mixed Conifer Forest	Low Montane and Foothill Mixed Chaparral Canyon Oak Woodland

**Soil Profile Description**

Surface Soil	0-11" brown to light brown very gravelly sandy loam, weak to moderate medium granular structure, 35-45% gravel, slightly acid.	0-7" yellowish brown very gravelly loam, moderate medium subangular blocky structure, 40% gravel and cobbles, neutral.
Subsoil	11-23" light brown very gravelly sandy loam, moderate fine subangular blocky structure, 55% gravel and cobbles, slightly acid.	7-15" yellowish brown very gravelly loam, moderate medium subangular blocky structure, 55% gravel and cobbles, neutral.
Substratum	23-34" highly fractured, slightly weathered metamorphic rock.	15-20" fractured metavolcanic rock.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	5	7
Adapted Species Group	DF, PP, SP	BL
Soil Erodibility	Low	Moderate
AWC for Profile Depth	2.3-4.8	0.7-1.9
AWC for Surface 24"	1.6-3.2	0.7-1.9
Seedling Survival Potential	Low-Moderate	V. Low
Plantability Potential	Moderate-High	V. Low-Low
Hydrologic Soil Group	B	D
Potential for Roadbed Damage	Moderate	Low
Inclusions (20%)	Typic Xerorthents, Rubble land Rock outcrop, metamorphic	

Remarks:

**209 Neuns-Goulding families association, 60 to 80 percent slopes**

Map Unit Components	<b>Neuns family (60%)</b>	<b>Goulding family (30%)</b>
Geomorphic Position	Very steep, dissected mountain sideslopes.	Very steep, dissected mountain sideslopes.
Typical Vegetation Series	Douglas-fir Pine Mixed Conifer Forest	Low Montane and Foothill Mixed Chaparral

**Soil Profile Description**

Surface Soil	0-11" brown to light brown very gravelly sandy loam, weak to moderate medium granular structure, 35-45% gravel, slightly acid.	0-7" yellowish brown very gravelly loam, moderate medium subangular blocky structure, 40% gravel and cobbles, neutral.
Subsoil	11-23" light brown very gravelly sandy loam, moderate fine subangular blocky structure, 55% gravel and cobbles, slightly acid.	7-15" yellowish brown very gravelly loam, moderate medium subangular blocky structure, 55% gravel and cobbles, neutral.
Substratum	23-34" highly fractured, slightly weathered metamorphic rock.	15-20" fractured metavolcanic rock.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	5	7
Adapted Species Group	DF, PP, SP	BL
Soil Erodibility	Low	Moderate
AWC for Profile Depth	2.3-4.8	0.7-1.9
AWC for Surface 24"	1.6-3.2	0.7-1.9
Seedling Survival Potential	Low-Moderate	V. Low
Plantability Potential	Low	V. Low
Hydrologic Soil Group	B	D
Potential for Roadbed Damage	Moderate	Low
Inclusions (10%)	Deadwood family Rubble land Typic Xerorthents, Rock outcrop, metamorphic	

Remarks:

**210 Neuns-Holland families complex, 20 to 40 percent slopes**

<b>Map Unit Components</b>	<b>Neuns family (50%)</b>	<b>Holland family (30%)</b>
<b>Geomorphic Position</b>	Moderately steep, dissected mountain sideslopes.	Moderately steep mountain sideslopes, benches toe slopes.
<b>Typical Vegetation Series</b>	Douglas-fir-Pine Mixed Conifer Forest	Douglas-fir-Pine Mixed Conifer Forest

**Soil Profile Description**

<b>Surface Soil</b>	0-11" brown to light brown very gravelly sandy loam, weak to moderate medium granular structure, 35-45% gravel, slightly acid.	0-3" brown gravelly loam, strong fine granular structure, 30% gravel, slightly acid.
<b>Subsoil</b>	11-23" light brown very gravelly sandy loam, moderate fine subangular blocky structure, 55% gravel and cobbles, slightly acid.	3-18" light brown gravelly loam and gravelly clay loam, weak fine and moderate medium subangular blocky structure, 20 to 30% gravel, slightly to medium acid. 18-26" reddish yellow extremely gravelly sandy clay loam, moderate very fine subangular blocky structure, 70% gravel and cobbles, medium acid.
<b>Substratum</b>	23-34" highly fractured, slightly weathered metamorphic rock.	26-30" highly fractured, moderately weathered metavolcanic rock.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	5	4-5
<b>Adapted Species Group</b>	DF, PP, SP	DF, PP, SP
<b>Soil Erodibility</b>	Low	Moderate
<b>AWC for Profile Depth</b>	2.3-4.8	3.0-4.4
<b>AWC for Surface 24"</b>	1.6-3.2	2.7-4.1
<b>Seedling Survival Potential</b>	Low-High	Moderate-High
<b>Plantability Potential</b>	High	High
<b>Hydrologic Soil Group</b>	B	B
<b>Potential for Roadbed Damage</b>	Moderate	High
<b>Inclusions (20%)</b>	Hugo family Marpa family Holland, deep family	

Remarks:

**211 Neuns-Holland families complex, 40 to 60 percent slopes**

Map Unit Components	Neuns family (50%)	Holland family (25%)
Geomorphic Position	Steep, dissected mountain sideslopes.	Steep mountain sideslopes, benches toe slopes.
Typical Vegetation Series	Douglas-fir-Pine Mixed Conifer Forest	Douglas-fir-Pine Mixed Conifer Forest

**Soil Profile Description**

Surface Soil	0-11" brown to light brown very gravelly sandy loam, weak to moderate medium granular structure, 35-45% gravel, slightly acid.	0-3" brown gravelly loam, strong fine granular structure, 30% gravel, slightly acid.
Subsoil	11-23" light brown very gravelly sandy loam, moderate fine subangular blocky structure, 55% gravel and cobbles, slightly acid.	3-18" light brown gravelly loam and gravelly clay loam, weak fine and moderate medium subangular blocky structure, 20 to 30% gravel, slightly to medium acid. 18-26" reddish yellow extremely gravelly sandy clay loam, moderate very fine subangular blocky structure, 70% gravel and cobbles, medium acid.
Substratum	23-34" highly fractured, slightly weathered metamorphic rock.	26-30" highly fractured, moderately weathered metavolcanic rock.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	5	4-5
Adapted Species Group	DF, PP, SP	DF, PP, SP
Soil Erodibility	Low	Moderate
AWC for Profile Depth	2.3-4.8	3.0-4.4
AWC for Surface 24"	1.6-3.2	2.7-4.1
Seedling Survival Potential	Low-High	Moderate-High
Plantability Potential	Moderate-High	High
Hydrologic Soil Group	B	B
Potential for Roadbed Damage	Moderate	High
Inclusions (20%)	Neuns, deep family Marpa family Deadwood family	

Remarks:

**212 Neuns-Holland families complex, 60 to 80 percent slopes**

Map Unit Components	<b>Neuns family (50%)</b>	<b>Holland family (30%)</b>
Geomorphic Position	Very steep, dissected mountain sideslopes.	Very steep mountain sideslopes, benches toe slopes.
Typical Vegetation Series	Douglas-fir-Pine Mixed Conifer Forest	Douglas-fir-Pine Mixed Conifer Forest

**Soil Profile Description**

Surface Soil	0-11" brown to light brown very gravelly sandy loam, weak to moderate medium granular structure, 35-45% gravel, slightly acid.	0-3" brown gravelly loam, strong fine granular structure, 30% gravel, slightly acid.
Subsoil	11-23" light brown very gravelly sandy loam, moderate fine subangular blocky structure, 55% gravel and cobbles, slightly acid.	3-18" light brown gravelly loam and gravelly clay loam, weak fine and moderate medium subangular blocky structure, 20 to 30% gravel, slightly to medium acid. 18-26" reddish yellow extremely gravelly sandy clay loam, moderate very fine subangular blocky structure, 70% gravel and cobbles, medium acid.
Substratum	23-34" highly fractured, slightly weathered metamorphic rock.	26-30" highly fractured, moderately weathered metavolcanic rock.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	5	4-5
Adapted Species Group	DF, PP, SP	DF, PP, SP
Soil Erodibility	Low	Moderate
AWC for Profile Depth	2.3-4.8	3.0-4.4
AWC for Surface 24"	1.6-3.2	2.7-4.1
Seedling Survival Potential	Low-High	Moderate-High
Plantability Potential	Low	Low
Hydrologic Soil Group	B	B
Potential for Roadbed Damage	Moderate	High
Inclusions (20%)	Marpa family Deadwood family Rubble land	

Remarks:

**213 Neuns-Holland, deep families complex, 20 to 40 percent slopes**

<b>Map Unit Components</b>	<b>Neuns family (55%)</b>	<b>Holland family, deep (25%)</b>
<b>Geomorphic Position</b>	Moderately steep, dissected mountain sideslopes.	Moderately steep, dissected mountain sideslopes, toe slopes.
<b>Typical Vegetation Series</b>	Douglas-fir-Pine Mixed Conifer Forest	Douglas-fir-Pine Mixed Conifer Forest

**Soil Profile Description**

<b>Surface Soil</b>	0-11" brown to light brown very gravelly sandy loam, weak to moderate medium granular structure, 35-45% gravel, slightly acid.	0-3" brown gravelly loam, strong medium granular structure, 20% gravel and cobbles, neutral.
<b>Subsoil</b>	11-23" light brown very gravelly sandy loam, moderate fine subangular blocky structure, 55% gravel and cobbles, slightly acid.	3-46" light brown to reddish yellow gravelly clay loam and cobbly clay loam, moderate medium and coarse subangular blocky structure 15 to 20% gravel and cobbles, slightly acid.
<b>Substratum</b>	23-34" highly fractured, slightly weathered metamorphic rock.	46-50" reddish yellow extremely cobbly clay loam, strong medium subangular blocky structure, 65% gravel and cobbles, slightly acid.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	5	3-4
<b>Adapted Species Group</b>	DF, PP, SP	DF, PP, SP
<b>Soil Erodibility</b>	Low	Moderate
<b>AWC for Profile Depth</b>	2.3-4.8	6.0-9.7
<b>AWC for Surface 24"</b>	1.6-3.2	2.0-5.0
<b>Seedling Survival Potential</b>	Low-High	Moderate-High
<b>Plantability Potential</b>	High-Moderate	High
<b>Hydrologic Soil Group</b>	B	B
<b>Potential for Roadbed Damage</b>	Moderate	High
<b>Inclusions (20%)</b>	Marpa family Holland family	

Remarks:

**214 Neuns-Holland, deep families complex, 40 to 80 percent slopes**

<b>Map Unit Components</b>	<b>Neuns family (50%)</b>	<b>Holland family, deep (25%)</b>
<b>Geomorphic Position</b>	Steep to very steep, dissected linear, mountain sideslopes.	Steep, dissected linear mountain sideslopes. More common on toe slopes and terraces.
<b>Typical Vegetation Series</b>	Douglas-fir-Pine Mixed Conifer Forest	Douglas-fir-Pine Mixed Conifer Forest

**Soil Profile Description**

<b>Surface Soil</b>	0-11" brown to light brown very gravelly sandy loam, weak to moderate medium granular structure, 35-45% gravel, slightly acid.	0-3" brown gravelly loam, strong medium granular structure, 20% gravel and cobbles, neutral.
<b>Subsoil</b>	11-23" light brown very gravelly sandy loam, moderate fine subangular blocky structure, 55% gravel and cobbles, slightly acid.	3-46" light brown to reddish yellow gravelly clay loam and cobbly clay loam, moderate medium and coarse subangular blocky structure 15 to 20% gravel and cobbles, slightly acid.
<b>Substratum</b>	23-34" highly fractured, slightly weathered metamorphic rock.	46-50" reddish yellow extremely cobbly clay loam, strong medium subangular blocky structure, 65% gravel and cobbles, slightly acid.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	5	3-4
<b>Adapted Species Group</b>	DF, PP, SP	DF, PP, SP
<b>Soil Erodibility</b>	Low	Moderate
<b>AWC for Profile Depth</b>	2.3-4.8	6.0-9.7
<b>AWC for Surface 24"</b>	1.6-3.2	2.0-5.0
<b>Seedling Survival Potential</b>	Low-High	Moderate-High
<b>Plantability Potential</b>	Moderate	High
<b>Hydrologic Soil Group</b>	B	B
<b>Potential for Roadbed Damage</b>	Moderate	High
<b>Inclusions (25%)</b>	Marpa family, deep Neuns, deep family Deadwood family Dunsmuir family	

Remarks:

**215 Neuns-Hugo families complex, 20 to 40 percent slopes**

<b>Map Unit Components</b>	<b>Neuns family (50%)</b>	<b>Hugo family (30%)</b>
<b>Geomorphic Position</b>	Moderately steep, dissected mountain sideslopes.	Moderately steep, dissected mountain sideslopes.
<b>Typical Vegetation Series</b>	Douglas-fir-Pine Mixed Conifer Forest, Mixed Conifer-Fir Forest	Douglas-fir-Pine Mixed Conifer Forest, Mixed Conifer-Fir Forest

**Soil Profile Description**

<b>Surface Soil</b>	0-11" brown to light brown very gravelly sandy loam, weak to moderate medium granular structure, 35-45% gravel, slightly acid.	0-4" brown loam. weak very fine granular structure, 10% gravel, medium acid.
<b>Subsoil</b>	11-23" light brown very gravelly sandy loam, moderate fine subangular blocky structure, 55% gravel and cobbles, slightly acid.	4-50" light yellowish brown loam to pale brown gravelly sandy clay loam, weak to moderate fine subangular blocky structure, 10-30% gravel, medium to strongly acid.
<b>Substratum</b>	23-34" highly fractured, slightly weathered metamorphic rock.	50-68" highly fractured, slightly to moderately weathered metasediments.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	5	3-4
<b>Adapted Species Group</b>	DF, PP, SP	DF, PP, SP
<b>Soil Erodibility</b>	Low	Moderate
<b>AWC for Profile Depth</b>	2.3-4.8	4.0-7.5
<b>AWC for Surface 24"</b>	1.6-3.2	2.4-4.1
<b>Seedling Survival Potential</b>	Low-High	Moderate-High
<b>Plantability Potential</b>	High-Moderate	High
<b>Hydrologic Soil Group</b>	B	B
<b>Potential for Roadbed Damage</b>	Moderate	High
<b>Inclusions (20%)</b>	Hugo family, moderately deep Holland, deep family Marpa family	

Remarks:

**216 Neuns-Hugo families complex, 40 to 60 percent slopes**

Map Unit Components	<b>Neuns family (50%)</b>	<b>Hugo family (30%)</b>
Geomorphic Position	Steep, dissected mountain sideslopes.	Steep, dissected mountain sideslopes.
Typical Vegetation Series	Douglas-fir-Pine Mixed Conifer Forest	Douglas-fir-Pine Mixed Conifer Forest, Douglas-fir White Fir Mixed Conifer Forest

**Soil Profile Description**

Surface Soil	0-11" brown to light brown very gravelly sandy loam, weak to moderate medium granular structure, 35-45% gravel, slightly acid.	0-4" brown loam. weak very fine granular structure, 10% gravel, medium acid.
Subsoil	11-23" light brown very gravelly sandy loam, moderate fine subangular blocky structure, 55% gravel and cobbles, slightly acid.	4-50" light yellowish brown loam to pale brown gravelly sandy clay loam, weak to moderate fine subangular blocky structure, 10-30% gravel, medium to strongly acid.
Substratum	23-34" highly fractured, slightly weathered metamorphic rock.	50-68" highly fractured, slightly to moderately weathered metasediments.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	5	3-4
Adapted Species Group	DF, PP, SP	DF, PP, SP
Soil Erodibility	Low	Moderate
AWC for Profile Depth	2.3-4.8	4.0-7.5
AWC for Surface 24"	1.6-3.2	2.4-4.1
Seedling Survival Potential	Low-High	Moderate-High
Plantability Potential	High-Moderate	High
Hydrologic Soil Group	B	B
Potential for Roadbed Damage	Moderate	High
Inclusions (20%)	Neuns, deep family Hugo family, moderately deep Deadwood family	

Remarks:

**217 Neuns-Hugo families complex, 60 to 80 percent slopes**

<b>Map Unit Components</b>	<b>Neuns family (50%)</b>	<b>Hugo family (30%)</b>
<b>Geomorphic Position</b>	Very steep, dissected mountain sideslopes.	Very steep, dissected mountain sideslopes.
<b>Typical Vegetation Series</b>	Douglas-fir-Pine Mixed Conifer Forest, Mixed Conifer-Fir Forest	Douglas-fir-Pine Mixed Conifer Forest, Mixed Conifer - Fir Forest

**Soil Profile Description**

<b>Surface Soil</b>	0-11" brown to light brown very gravelly sandy loam, weak to moderate medium granular structure, 35-45% gravel, slightly acid.	0-4" brown loam. weak very fine granular structure, 10% gravel, medium acid.
<b>Subsoil</b>	11-23" light brown very gravelly sandy loam, moderate fine subangular blocky structure, 55% gravel and cobbles, slightly acid.	4-50" light yellowish brown loam to pale brown gravelly sandy clay loam, weak to moderate fine subangular blocky structure, 10-30% gravel, medium to strongly acid.
<b>Substratum</b>	23-34" highly fractured, slightly weathered metamorphic rock.	50-68" highly fractured, slightly to moderately weathered metasediments.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	5	3-4
<b>Adapted Species Group</b>	DF, PP, SP	DF, PP, SP
<b>Soil Erodibility</b>	Low	Moderate
<b>AWC for Profile Depth</b>	2.3-4.8	4.0-7.5
<b>AWC for Surface 24"</b>	1.6-3.2	2.4-4.1
<b>Seedling Survival Potential</b>	Low-High	Moderate-High
<b>Plantability Potential</b>	Low	Low
<b>Hydrologic Soil Group</b>	B	B
<b>Potential for Roadbed Damage</b>	Moderate	High
<b>Inclusions (20%)</b>	Neuns, deep family Deadwood family	

Remarks:

**218 Neuns-Marpa families complex, 40 to 60 percent slopes**

<b>Map Unit Components</b>	<b>Neuns family (50%)</b>	<b>Marpa family (30%)</b>
<b>Geomorphic Position</b>	Steep, dissected mountain sideslopes.	Steep, dissected mountain sideslopes.
<b>Typical Vegetation Series</b>	Douglas-fir-Pine Mixed Conifer Forest	Douglas-fir-Pine Mixed Conifer Forest

**Soil Profile Description**

<b>Surface Soil</b>	0-11" brown to light brown very gravelly sandy loam, weak to moderate medium granular structure, 35-45% gravel, slightly acid.	0-13" brown heavy loam and gravelly light clay loam, moderate and weak medium granular structure, 5-35% gravel, slightly acid.
<b>Subsoil</b>	11-23" light brown very gravelly sandy loam, moderate fine subangular blocky structure, 55% gravel and cobbles, slightly acid.	13-26" light brown very gravelly clay loam, massive, 40-50% gravel, strongly acid.
<b>Substratum</b>	23-34" highly fractured, slightly weathered metamorphic rock.	26-32" fractured shale.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	5	5
<b>Adapted Species Group</b>	DF, PP, SP	DF, PP, SP
<b>Soil Erodibility</b>	Low	Moderate
<b>AWC for Profile Depth</b>	2.3-4.8	2.0-4.5
<b>AWC for Surface 24"</b>	1.6-3.2	1.6-3.3
<b>Seedling Survival Potential</b>	Low-High	Low-High
<b>Plantability Potential</b>	Moderate-High	Moderate-High
<b>Hydrologic Soil Group</b>	B	B
<b>Potential for Roadbed Damage</b>	Moderate	Moderate
<b>Inclusions (20%)</b>	Hugo, moderately deep family Holland family Deadwood family	

**Remarks:**

**219 Neuns-Marpa families complex, 60 to 80 percent slopes**

Map Unit Components	<b>Neuns family (50%)</b>	<b>Marpa family (30%)</b>
Geomorphic Position	Very steep, mountain sideslopes.	Very steep, mountain sideslopes.
Typical Vegetation Series	Douglas-fir-Pine Mixed Conifer Forest	Douglas-fir-Pine Mixed Conifer Forest

**Soil Profile Description**

Surface Soil	0-11" brown to light brown very gravelly sandy loam, weak to moderate medium granular structure, 35-45% gravel, slightly acid.	0-13" brown heavy loam and gravelly light clay loam, moderate and weak medium granular structure, 5-35% gravel, slightly acid.
Subsoil	11-23" light brown very gravelly sandy loam, moderate fine subangular blocky structure, 55% gravel and cobbles, slightly acid.	13-26" light brown very gravelly clay loam, massive, 40-50% gravel, strongly acid.
Substratum	23-34" highly fractured, slightly weathered metamorphic rock.	26-32" fractured shale.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	5	5
Adapted Species Group	DF, PP, SP	DF, PP, SP
Soil Erodibility	Low	Moderate
AWC for Profile Depth	2.3-4.8	2.0-4.5
AWC for Surface 24"	1.6-3.2	1.6-3.3
Seedling Survival Potential	Low-High	Low-High
Plantability Potential	Low	Low
Hydrologic Soil Group	B	B
Potential for Roadbed Damage	Moderate	Moderate
Inclusions (20%)	Deadwood family Hugo, moderately deep family Typic Xerorthents	

Remarks:

**220 Neuns-Marpa-Deadwood families complex, 40 to 60 percent slopes**

Map Unit Components	Neuns family (35%)	Marpa family (35%)	Deadwood family (20%)
Geomorphic Position	Steep mountain sideslopes.	Steep mountain sideslopes.	Ridge tops and very steep mountain sideslopes.
Typical Vegetation Series	Upper Montane Mixed Chaparral Douglas-fir-Pine Mixed Conifer Forest	Upper Montane Mixed Chaparral Douglas-fir-Pine Mixed Conifer Forest	Upper Montane Mixed Chaparral Bare Soil

**Soil Profile Description**

Surface Soil	0-11" brown to light brown very gravelly sandy loam, weak to moderate medium granular structure, 35-45% gravel, slightly acid.	0-13" brown heavy loam and gravelly light clay loam, moderate and weak medium granular structure, 5-35% gravel, slightly acid.	0-3" brown very gravelly sandy loam, weak fine granular structure, 55% gravel, neutral, slightly acid.
Subsoil	11-23" light brown very gravelly sandy loam, moderate fine subangular blocky structure, 55% gravel and cobbles, slightly acid.	13-26" light brown very gravelly clay loam, massive, 40-50% gravel, strongly acid.	3-15" yellowish brown and light brown very gravelly loam and extremely cobbly heavy loam, weak fine and medium subangular blocky structure, 55 to 65% gravel and cobbles, slightly to medium acid.
Substratum	23-34" highly fractured, slightly weathered metamorphic rock.	26-32" fractured shale.	15-17" metamorphosed shale, moderately fractured, slightly weathered.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	5	5	6-7
Adapted Species Group	DF, PP, SP	DF, PP, SP	DF, PP, SP, BL
Soil Erodibility	Low	Moderate	Low
AWC for Profile Depth	2.3-4.8	2.0-4.5	0.9-1.5
AWC for Surface 24"	1.6-3.2	1.6-3.3	0.9-1.5
Seedling Survival Potential	Low-Moderate	Low-Moderate	V. Low-Low
Plantability Potential	Moderate-High	Moderate-High	V. Low-Low
Hydrologic Soil Group	B	B	C
Potential for Roadbed Damage	Moderate	Moderate	Low

Inclusions (10%)

Marpa, deep family  
Neuns, deep family

Remarks:

Mapped on extensive, recently burned over lands. Rills and gullies are common, gravel payment extensive. Regeneration potential is reduced due to decreased AWC and planting potential.

**221 Neuns-Marpa, deep families complex, 40 to 60 percent slopes**

Map Unit Components	<b>Neuns family (60%)</b>	<b>Marpa family, deep (30%)</b>
Geomorphic Position	Steep mountain sideslopes.	Steep mountain sideslopes
Typical Vegetation Series	Douglas-fir-Pine Mixed Conifer Forest	Douglas-fir-Pine Mixed Conifer Forest

**Soil Profile Description**

Surface Soil	0-11" brown to light brown very gravelly sandy loam, weak to moderate medium granular structure, 35-45% gravel, slightly acid.	0-6" very pale brown gravelly loam, moderate medium granular structure, 27% gravel, slightly acid.
Subsoil	11-23" light brown very gravelly sandy loam, moderate fine subangular blocky structure, 55% gravel and cobbles, slightly acid.	6-72" light yellowish brown to yellow very gravelly clay loam, moderate fine and medium subangular blocky structure, 15 to 20% gravel and cobbles, slightly acid.
Substratum	23-34" highly fractured, slightly weathered metamorphic rock.	Metamorphic rock at greater than 70" depth.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	5	4
Adapted Species Group	DF, PP, SP	DF, PP, SP
Soil Erodibility	Low	Low
AWC for Profile Depth	2.3-4.8	5.7-8.5
AWC for Surface 24"	1.6-3.0	2.3-3.4
Seedling Survival Potential	Low-Moderate	Moderate-High
Plantability Potential	Moderate-High	High
Hydrologic Soil Group	B	B
Potential for Roadbed Damage	Moderate	Moderate
Inclusions (10%)	Neuns family, deep Marpa family Deadwood family Olete family	

Remarks:

**222 Neuns family-Neuns family, deep complex, 60 to 80 percent slopes**

<b>Map Unit Components</b>	<b>Neuns family (50%)</b>	<b>Neuns family, deep (30%)</b>
<b>Geomorphic Position</b>	Very steep, dissected mountain sideslopes.	Very steep, dissected mountain sideslopes.
<b>Typical Vegetation Series</b>	Douglas-fir-Pine Mixed Conifer Forest	Douglas-fir-Pine Mixed Conifer Forest

**Soil Profile Description**

<b>Surface Soil</b>	0-11" brown to light brown very gravelly sandy loam, weak to moderate medium granular structure, 35-45% gravel, slightly acid.	0-9" brown gravelly loam and very gravelly loam, moderate fine and very fine granular structure, 30-50% gravel and cobbles, neutral to slightly acid.
<b>Subsoil</b>	11-23" light brown very gravelly sandy loam, moderate fine subangular blocky structure, 55% gravel and cobbles, slightly acid.	9-61" light yellowish brown very gravelly loam to pale yellow very cobbly light clay loam, massive 50-55% gravel and cobbles, slightly to medium acid.
<b>Substratum</b>	23-34" highly fractured, slightly weathered metamorphic rock.	

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	5	4-5
<b>Adapted Species Group</b>	DF, PP, SP	DF, PP, SP
<b>Soil Erodibility</b>	Low	Moderate
<b>AWC for Profile Depth</b>	2.3-4.8	2.7-5.7
<b>AWC for Surface 24"</b>	1.6-3.0	2.0-3.4
<b>Seedling Survival Potential</b>	Low-Moderate	Moderate-High
<b>Plantability Potential</b>	Low	Low
<b>Hydrologic Soil Group</b>	B	B
<b>Potential for Roadbed Damage</b>	Moderate	Moderate
<b>Inclusions (20%)</b>	Marpa family, deep Deadwood family	
<b>Remarks:</b>		

**223 Neuns family-Rock outcrop association, 40 to 60 percent slopes**

<b>Map Unit Components</b>	<b>Neuns family (60%)</b>	<b>Rock outcrop (30%)</b>
<b>Geomorphic Position</b>	Steep, dissected mountain sideslopes.	Very steep and steep, dissected mountain sideslopes.
<b>Typical Vegetation Series</b>	Douglas-fir-Pine - Canyon Oak Forest	Low Montane Rockland Shrub

**Soil Profile Description**

<b>Surface Soil</b>	0-11" brown to light brown very gravelly sandy loam, weak to moderate medium granular structure, 35-45% gravel, slightly acid.
<b>Subsoil</b>	11-23" light brown very gravelly sandy loam, moderate fine subangular blocky structure, 55% gravel and cobbles, slightly acid.
<b>Substratum</b>	23-34" highly fractured, slightly weathered metamorphic rock.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	5	
<b>Adapted Species Group</b>	DF, PP, SP	
<b>Soil Erodibility</b>	Low	
<b>AWC for Profile Depth</b>	2.3-4.8	
<b>AWC for Surface 24"</b>	1.6-3.0	
<b>Seedling Survival Potential</b>	Moderate-Low	
<b>Plantability Potential</b>	Low	V. Low
<b>Hydrologic Soil Group</b>	B	B
<b>Potential for Roadbed Damage</b>	Moderate	Low
<b>Inclusions (10%)</b>	Deadwood family Typic Xerorthents Rubble land Rock outcrop	

**Remarks:**

**224 Neuns family-Typic Xerorthents, association, 50 to 80 percent slopes**

<b>Map Unit Components</b>	<b>Neuns family (60%)</b>	<b>Typic Xerorthents (30%)</b>
<b>Geomorphic Position</b>	Very steep, dissected, linear mountain sideslopes.	Very steep, dissected, linear mountain sideslopes.
<b>Typical Vegetation Series</b>	Douglas-fir-Pine Mixed Conifer Forest	Canyon Oak Woodland

**Soil Profile Description**

<b>Surface Soil</b>	0-11" brown to light brown very gravelly sandy loam, weak to moderate medium granular structure, 35-45% gravel, slightly acid.	0-15" light brownish gray to light yellowish brown extremely gravelly loam, single grain, 75 to 85% gravel and cobbles, neutral.
<b>Subsoil</b>	11-23" light brown very gravelly sandy loam, moderate fine subangular blocky structure, 55% gravel and cobbles, slightly acid.	
<b>Substratum</b>	23-34" highly fractured, slightly weathered metamorphic rock.	15-48" fragmental gravel and cobbles.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	5	6-7
<b>Adapted Species Group</b>	DF, PP, SP	BL, DF, PP, SP
<b>Soil Erodibility</b>	Low	Low
<b>AWC for Profile Depth</b>	2.3-4.8	0.6-2.1
<b>AWC for Surface 24"</b>	1.6-3.0	0.2-1.7
<b>Seedling Survival Potential</b>	Moderate-Low	V. Low-Low
<b>Plantability Potential</b>	Low	Low-V. Low
<b>Hydrologic Soil Group</b>	B	B
<b>Potential for Roadbed Damage</b>	Moderate	Low
<b>Inclusions (10%)</b>	Deadwood family Marpa family Rock outcrop, metamorphic	

**Remarks:**

**225 Neuns family, deep, 40 to 60 percent slopes**

Map Unit Components	<b>Neuns family (75%)</b>
Geomorphic Position	Steep, dissected mountain sideslopes.
Typical Vegetation Series	Douglas-fir-Pine Mixed Conifer Forest

**Soil Profile Description**

Surface Soil	0-9" brown gravelly loam and very gravelly loam, moderate fine and very fine granular structure, 30-50% gravel and cobbles, neutral to slightly acid.
Subsoil	9-61" light yellowish brown very gravelly loam to pale yellow very cobbly light clay loam, massive 50-55% gravel and cobbles, slightly to medium acid.
Substratum	

**Soil Properties & Management Interpretations**

Forest Survey Site Class	4-5
Adapted Species Group	DF, PP, SP
Soil Erodibility	Moderate
AWC for Profile Depth	2.7-5.7
AWC for Surface 24"	2.0-3.4
Seedling Survival Potential	Moderate-High
Plantability Potential	Moderate-High
Hydrologic Soil Group	B
Potential for Roadbed Damage	Moderate
Inclusions (25%)	Marpa family, deep Hugo family Neuns family Holland family, deep

Remarks:

**226 Neuns family, deep, 60 to 80 percent slopes**

Map Unit Components	<b>Neuns family (75%)</b>
Geomorphic Position	Very steep, linear, dissected mountain sideslopes.
Typical Vegetation Series	Douglas-fir-Pine Mixed Conifer Forest, Sierran-Cascade Mixed Conifer Forest

**Soil Profile Description**

Surface Soil	0-9" brown gravelly loam and very gravelly loam, moderate fine and very fine granular structure, 30-50% gravel and cobbles, neutral to slightly acid.
Subsoil	9-61" light yellowish brown very gravelly loam to pale yellow very cobbly light clay loam, massive 50-55% gravel and cobbles, slightly to medium acid.
Substratum	

**Soil Properties & Management Interpretations**

Forest Survey Site Class	4-5
Adapted Species Group	DF, PP, SP
Soil Erodibility	Moderate
AWC for Profile Depth	2.7-5.7
AWC for Surface 24"	2.0-3.4
Seedling Survival Potential	Moderate-High
Plantability Potential	Moderate-High
Hydrologic Soil Group	B
Potential for Roadbed Damage	Moderate
Inclusions (25%)	Marpa family, deep Huntmount family Neuns family

Remarks:

**227 Neuns, deep-Hugo families complex, 20 to 40 percent slopes**

Map Unit Components	Neuns family, deep (60%)	Hugo family (30%)
Geomorphic Position	Steep, dissected mountain sideslopes.	Steep, dissected mountain sideslopes.
Typical Vegetation Series	Douglas-fir-Pine Mixed Conifer Forest, Mixed Conifer-Fir Forest	Douglas-fir-Pine Mixed Conifer Forest, Mixed Conifer-Fir Forest

**Soil Profile Description**

Surface Soil	0-9" brown gravelly loam and very gravelly loam, moderate fine and very fine granular structure, 30-50% gravel and cobbles, neutral to slightly acid.	0-4" brown loam, weak very fine granular structure, 10% gravel, medium acid.
Subsoil	9-61" light yellowish brown very gravelly loam to pale yellow very cobbly light clay loam, massive 50-55% gravel and cobbles, slightly to medium acid.	4-50" light yellowish brown loam to pale brown gravelly sandy clay loam, weak to moderate fine subangular blocky structure, 10 to 30% gravel, medium to strongly acid.
Substratum		50-68" highly fractured, slightly to moderately weathered metasediments.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	4-5	3-4
Adapted Species Group	DF, PP, SP	DF, PP, SP
Soil Erodibility	Moderate	Moderate
AWC for Profile Depth	2.7-5.7	4.0-7.5
AWC for Surface 24"	2.0-3.4	2.4-4.1
Seedling Survival Potential	Moderate-High	High
Plantability Potential	High	High
Hydrologic Soil Group	B	B
Potential for Roadbed Damage	Moderate	High
Inclusions (10%)	Neuns family Holland family, deep Marpa family, deep	

Remarks:

**228 Neuns family, deep-Neuns family complex, 40 to 70 percent slopes**

Map Unit Components	Neuns family, deep (50%)	Neuns family (30%)
Geomorphic Position	Steep to very steep, linear mountain sideslopes.	Steep, linear, broken, dissected mountain sideslopes.
Typical Vegetation Series	Douglas-fir-Pine Mixed Conifer Forest	Douglas-fir-Pine Mixed Conifer Forest

**Soil Profile Description**

Surface Soil	0-9" brown gravelly loam and very gravelly loam, moderate fine and very fine granular structure, 30-50% gravel and cobbles, neutral to slightly acid.	0-11" brown to light brown very gravelly sandy loam, weak to moderate medium granular structure, 35-45% gravel, slightly acid.
Subsoil	9-61" light yellowish brown very gravelly loam to pale yellow very cobbly light clay loam, massive 50-55% gravel and cobbles, slightly to medium acid.	11-23" light brown very gravelly sandy loam, moderate fine subangular blocky structure, 55% gravel and cobbles, slightly acid.
Substratum		23-34" highly fractured, slightly weathered metamorphic rock.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	4-5	5
Adapted Species Group	DF, PP, SP	DF, PP, SP
Soil Erodibility	Moderate	Low
AWC for Profile Depth	2.7-5.7	2.3-4.8
AWC for Surface 24"	2.0-3.4	1.6-3.0
Seedling Survival Potential	Moderate-High	Low-Moderate
Plantability Potential	Moderate-High	Moderate
Hydrologic Soil Group	B	B
Potential for Roadbed Damage	Moderate	Moderate
Inclusions (20%)	Marpa family, deep Deadwood family Marpa family	

Remarks:

**229 Neuns family, schist substratum, 60 to 80 percent slopes**

Map Unit Components	<b>Neuns family, schist substratum (75%)</b>
Geomorphic Position	Very steep, dissected mountain sideslopes.
Typical Vegetation Series	Douglas-fir-Pine Mixed Conifer Forest, Mixed Conifer-Fir Forest

**Soil Profile Description**

Surface Soil	0-4" light gray very gravelly loam, moderate medium granular structure, 40% gravel, slightly acid.
Subsoil	4-16" light gray very gravelly loam, moderate medium subangular blocky structure, 45% gravel and cobbles, medium acid.
Substratum	16-26" light gray extremely gravelly loam, moderate medium subangular blocky structure, 80% gravel and cobbles, strongly acid. 26-40" highly fractured moderately weathered metavolcanic schist.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	5
Adapted Species Group	DF, PP, SP
Soil Erodibility	Moderate
AWC for Profile Depth	2.0-4.2
AWC for Surface 24"	1.5-3.0
Seedling Survival Potential	Low-Moderate
Plantability Potential	Moderate
Hydrologic Soil Group	B
Potential for Roadbed Damage	Moderate
Inclusions (25%)	Neuns family Neuns family, deep Rubble land Deadwood family

Remarks:

**230 Neuns family, schist substratum-Neuns family, deep complex, 20 to 40 percent slopes**

Map Unit Components	<b>Neuns family, schist substratum (60%)</b>	<b>Neuns family, deep (30%)</b>
Geomorphic Position	Moderately steep mountain sideslopes.	Moderately steep mountain sideslopes.
Typical Vegetation Series	Mixed Conifer-Black Oak Forest, Douglas-Fir-Pine Mixed Conifer Forest	Douglas-fir-Pine Mixed Conifer Forest

**Soil Profile Description**

Surface Soil	0-4" light gray very gravelly loam, moderate medium granular structure, 40% gravel, slightly acid.	0-9" brown gravelly loam and very gravelly loam, moderate fine and very fine granular structure, 30-50% gravel and cobbles, neutral to slightly acid.
Subsoil	4-16" light gray very gravelly loam, moderate medium subangular blocky structure, 45% gravel and cobbles, medium acid.	9-61" light yellowish brown very gravelly loam to pale yellow very cobbly light clay loam, massive 50-55% gravel and cobbles, slightly to medium acid.
Substratum	16-26" light gray extremely gravelly loam, moderate medium subangular blocky structure, 80% gravel and cobbles, strongly acid. 26-40" highly fractured moderately weathered metavolcanic schist.	

**Soil Properties & Management Interpretations**

Forest Survey Site Class	5	4-5
Adapted Species Group	DF, PP, SP	DF, PP, SP
Soil Erodibility	Moderate	Moderate
AWC for Profile Depth	2.0-4.2	2.7-5.7
AWC for Surface 24"	1.5-3.0	2.0-3.4
Seedling Survival Potential	Low-Moderate	Moderate-High
Plantability Potential	High	High
Hydrologic Soil Group	B	B
Potential for Roadbed Damage	Moderate	Moderate
Inclusions (10%)	Neuns family Deadwood family Hugo family	

Remarks:

## 231 Olete family, 20 to 40 percent slopes

Map Unit Components	<b>Olete family (75%)</b>
Geomorphic Position	Moderately steep mountain sideslopes.
Typical Vegetation Series	Klamath Enriched Mixed Conifer Forest, Jeffrey Pine Mixed Conifer Forest

### Soil Profile Description

Surface Soil	0-6" pale brown gravelly loam, weak very fine granular structure, 30% gravel, slightly acid.
Subsoil	6-35" light yellowish brown very gravelly loam to brownish yellow very cobbly heavy loam, weak very fine to coarse subangular blocky structure, 35-55% gravel and cobbles, slightly acid to neutral.
Substratum	35-38" fractured ultramafic rock.

### Soil Properties & Management Interpretations

Forest Survey Site Class	5
Adapted Species Group	DF, PP, SP
Soil Erodibility	Low
AWC for Profile Depth	2.5-4.0
AWC for Surface 24"	1.6-3.1
Seedling Survival Potential	Low-Moderate
Plantability Potential	Moderate
Hydrologic Soil Group	B
Potential for Roadbed Damage	Moderate
Inclusions (25%)	Konocti family Lithic Haploxerafbs Dunsmuir family
Remarks:	Ca/Mg imbalance, possible toxicity. May limit species and growth on soils from ultramafics.

**232 Olete family, 40 to 60 percent slopes**

Map Unit Components	<b>Olete family (75%)</b>
Geomorphic Position	Steep, smooth mountain sideslopes.
Typical Vegetation Series	Klamath Enriched Mixed Conifer Forest, Jeffrey Pine Mixed Conifer Forest

**Soil Profile Description**

Surface Soil	0-6" pale brown gravelly loam, weak very fine granular structure, 30% gravel, slightly acid.
Subsoil	6-35" light yellowish brown very gravelly loam to brownish yellow very cobbly heavy loam, weak very fine to coarse subangular blocky structure, 35-55% gravel and cobbles, slightly acid to neutral.
Substratum	35-38" fractured ultramafic rock.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	5
Adapted Species Group	DF, PP, SP
Soil Erodibility	Low
AWC for Profile Depth	2.5-4.0
AWC for Surface 24"	1.6-3.1
Seedling Survival Potential	Low-Moderate
Plantability Potential	High-Low
Hydrologic Soil Group	B
Potential for Roadbed Damage	Moderate
Inclusions (25%)	Konocti family Lithic Haploxerafbs Rock outcrop, ultramafic Toadlake family
Remarks:	Ca/Mg imbalance, possible toxicity. May limit species and growth on soils from ultramafics.

**233 Olete-Ishi Pishi families, complex, 20 to 40 percent slopes**

<b>Map Unit Components</b>	<b>Olete family (60%)</b>	<b>Ishi Pishi family (30%)</b>
<b>Geomorphic Position</b>	Moderate steep mountain sideslopes.	Gently sloping and moderately steep mountain sideslopes.
<b>Typical Vegetation Series</b>	Jeffrey Pine Mixed Conifer Forest, Upper Montane Mixed Chaparral	Jeffrey Pine Mixed Conifer Forest, Upper Montane Mixed Chaparral

**Soil Profile Description**

<b>Surface Soil</b>	0-6" pale brown gravelly loam, weak very fine granular structure, 30% gravel, slightly acid.	0-7" reddish yellow gravelly loam and gravelly light clay loam, moderate medium granular structure, 20% gravel and cobbles, neutral.
<b>Subsoil</b>	6-35" light yellowish brown very gravelly loam to brownish yellow very cobbly heavy loam, weak very fine to coarse subangular blocky structure, 35-55% gravel and cobbles, slightly acid to neutral.	7-34" brown to strong brown gravelly clay loam to dark yellowish brown extremely gravelly or cobbly clay, moderate to strong fine subangular blocky structure, 30-80% gravel and cobbles, neutral.
<b>Substratum</b>	35-38" fractured ultramafic rock.	34-42" fractured ultramafic.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	5	5-6
<b>Adapted Species Group</b>	DF, PP, SP	JP, IC, DF
<b>Soil Erodibility</b>	Low	Moderate
<b>AWC for Profile Depth</b>	2.5-4.0	3.5-4.1
<b>AWC for Surface 24"</b>	1.6-3.1	1.8-3.8
<b>Seedling Survival Potential</b>	Low-Moderate	Low-High
<b>Plantability Potential</b>	Moderate-High	Moderate
<b>Hydrologic Soil Group</b>	B	C
<b>Potential for Roadbed Damage</b>	Moderate	Moderate
<b>Inclusions (10%)</b>	Rock outcrop Lithic Haploxeralfs Konocti family	
<b>Remarks:</b>	Ca/Mg imbalance limits species and growth in soil from ultramafics.	

**234 Olete-Ishi Pishi families complex, 40 to 60 percent slopes**

Map Unit Components	Olete family (60%)	Ishi Pishi family (30%)
Geomorphic Position	Steep mountain sideslopes.	Steep mountain sideslopes.
Typical Vegetation Series	Jeffrey Pine Mixed Conifer Forest, Upper Montane Mixed Chaparral	Jeffrey Pine Mixed Conifer Forest, Upper Montane Mixed Chaparral

**Soil Profile Description**

Surface Soil	0-6" pale brown gravelly loam, weak very fine granular structure, 30% gravel, slightly acid.	0-7" reddish yellow gravelly loam and gravelly light clay loam, moderate medium granular structure, 20% gravel and cobbles, neutral.
Subsoil	6-35" light yellowish brown very gravelly loam to brownish yellow very cobbly heavy loam, weak very fine to coarse subangular blocky structure, 35-55% gravel and cobbles, slightly acid to neutral.	7-34" brown to strong brown gravelly clay loam to dark yellowish brown extremely gravelly or cobbly clay, moderate to strong fine subangular blocky structure, 30-80% gravel and cobbles, neutral.
Substratum	35-38" fractured ultramafic rock.	34-42" fractured ultramafic.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	5	5-6
Adapted Species Group	DF, PP, SP	JP, IC, DF
Soil Erodibility	Low	Moderate
AWC for Profile Depth	2.5-4.0	3.5-4.1
AWC for Surface 24"	1.6-3.1	1.8-3.8
Seedling Survival Potential	Low-Moderate	Low-High
Plantability Potential	Moderate-Low	Low-Moderate
Hydrologic Soil Group	B	C
Potential for Roadbed Damage	Moderate	Moderate
Inclusions (10%)	Rock outcrop Lithic Haploxerafs Konocti family Dunsmuir family	
Remarks:	(Mg) Ishi Pishi limitations: Ca/Mg imbalance limits species.	

**235 Olete-Konocti families association, 50 to 80 percent slopes**

<b>Map Unit Components</b>	<b>Olete family (60%)</b>	<b>Konocti family (30%)</b>
<b>Geomorphic Position</b>	Very steep dissected mountain sideslopes.	Steep to very steep mountain sideslopes.
<b>Typical Vegetation Series</b>	Klamath Enriched Mixed Conifer Forest	Klamath Enriched Mixed Conifer Forest

**Soil Profile Description**

<b>Surface Soil</b>	0-6" pale brown gravelly loam, weak very fine granular structure, 30% gravel, slightly acid.	0-3" brown gravelly loam, weak very fine granular structure, 30% gravel and cobbles, slightly acid.
<b>Subsoil</b>	6-35" light yellowish brown very gravelly loam to brownish yellow very cobbly heavy loam, weak very fine to coarse subangular blocky structure, 35-55% gravel and cobbles, slightly acid to neutral.	3-22" yellowish red very gravelly loam to dark yellowish brown very stony clay loam, weak fine granular to weak fine subangular blocky structure, 35-45% gravel and cobbles, slightly acid to neutral.
<b>Substratum</b>	35-38" fractured ultramafic rock.	22-30" fractured ultramafic rock.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	5	5
<b>Adapted Species Group</b>	DF, PP, SP	DF, PP, SP
<b>Soil Erodibility</b>	Low	Moderate
<b>AWC for Profile Depth</b>	2.5-4.0	2.1-4.5
<b>AWC for Surface 24"</b>	1.6-3.1	2.0-2.6
<b>Seedling Survival Potential</b>	Low-Moderate	Moderate
<b>Plantability Potential</b>	Low	Moderate
<b>Hydrologic Soil Group</b>	B	B
<b>Potential for Roadbed Damage</b>	Moderate	Moderate
<b>Inclusions (10%)</b>	Weitchpec family Lithic Haploxeralfs Ishi Pishi family	
<b>Remarks:</b>	Ca/Mg imbalance limits species and growth on soils from ultramafics.	

**236 Olete family-Rock outcrop complex, 40 to 60 percent slopes**

Map Unit Components	<b>Olete family (50%)</b>	<b>Rock outcrop (30%)</b>
Geomorphic Position	Steep mountain sideslopes.	Steep mountain sideslopes.
Typical Vegetation Series	Klamath Enriched Mixed Conifer Forest, Jeffrey Pine Mixed Conifer Forest	

**Soil Profile Description**

Surface Soil	0-6" pale brown gravelly loam, weak very fine granular structure, 30% gravel, slightly acid.
Subsoil	6-35" light yellowish brown very gravelly loam to brownish yellow very cobbly heavy loam, weak very fine to coarse subangular blocky structure, 35-55% gravel and cobbles, slightly acid to neutral.
Substratum	35-38" fractured ultramafic rock.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	5	
Adapted Species Group	DF, PP, SP	
Soil Erodibility	Low	
AWC for Profile Depth	2.5-4.0	
AWC for Surface 24"	1.6-3.1	
Seedling Survival Potential	Low-Moderate	
Plantability Potential	Moderate	
Hydrologic Soil Group	B	D
Potential for Roadbed Damage	Moderate	Low
Inclusions (20%)	Konocti family Lithic Haploxerafbs Weitchpec family	
Remarks:	Ca/Mg imbalance and possible toxicity. May limit species and growth on soils from ultramafics.	

**237 Olete family-Rock outcrop complex, 60 to 90 percent slopes**

<b>Map Unit Components</b>	<b>Olete family (45%)</b>	<b>Rock outcrop (30%)</b>
<b>Geomorphic Position</b>	Very steep, undissected, linear, to broken mountain sideslopes.	Similar position as Olete family.
<b>Typical Vegetation Series</b>	Douglas-fir-Pine Mixed Conifer Forest, Sierran-Cascade Mixed Conifer Forest	

**Soil Profile Description**

<b>Surface Soil</b>	0-6" pale brown gravelly loam, weak very fine granular structure, 30% gravel, slightly acid.
<b>Subsoil</b>	6-35" light yellowish brown very gravelly loam to brownish yellow very cobbly heavy loam, weak very fine to coarse subangular blocky structure, 35-55% gravel and cobbles, slightly acid to neutral.
<b>Substratum</b>	35-38" fractured ultramafic rock.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	5	
<b>Adapted Species Group</b>	DF, PP, SP	
<b>Soil Erodibility</b>	Low	
<b>AWC for Profile Depth</b>	2.5-4.0	
<b>AWC for Surface 24"</b>	1.6-3.1	
<b>Seedling Survival Potential</b>	Low-Moderate	
<b>Plantability Potential</b>	V. Low	
<b>Hydrologic Soil Group</b>	B	D
<b>Potential for Roadbed Damage</b>	Moderate	Low
<b>Inclusions (25%)</b>	Rubble land, andesite Konocti family	
<b>Remarks:</b>	Ca/Mg imbalance and possible toxicity. May limit species and growth on soils from ultramafics.	

## 238 Ovall family, 40 to 60 percent slopes

Map Unit Components	<b>Ovall family (75%)</b>
Geomorphic Position	Steep, mountain sideslopes.
Typical Vegetation Series	Upper Montane Mixed Chaparral Sierran-Cascade Mixed Conifer Forest

### Soil Profile Description

Surface Soil	0-7" brown gravelly and very gravelly sandy loam, weak medium subangular blocky structure, 30-35% gravel, slightly acid.
Subsoil	7-40" brown gravelly sandy loam to light yellowish brown gravelly fine sandy loam, medium and coarse subangular blocky structure, 25-30% gravel, slightly to medium acid.
Substratum	40-60" very pale brown gravelly sandy loam, moderate medium and coarse subangular blocky structure, 30% gravel, strongly acid.

### Soil Properties & Management Interpretations

Forest Survey Site Class	3-4
Adapted Species Group	DF, PP, SP, WF
Soil Erodibility	Moderate
AWC for Profile Depth	5.0-7.7
AWC for Surface 24"	2.0-2.7
Seedling Survival Potential	Moderate
Plantability Potential	High
Hydrologic Soil Group	B
Potential for Roadbed Damage	V. High
Inclusions (25%)	Chaix family Chawanakee family
Remarks:	

**239 Ovall family, ponded-Aquic Xerorthents complex, 0 to 5 percent slopes**

<b>Map Unit Components</b>	<b>Ovall family, ponded (60%)</b>	<b>Aquic Xerorthents (30%)</b>
<b>Geomorphic Position</b>	Gently sloping flats and terraces.	Level dry lake beds, outwash flats and terraces.
<b>Typical Vegetation Series</b>	Low to Mid Montane Dry Glades, Lodgepole Pine Forest, Bitterbrush - Goldenbush Scrub	Low to Mid Montane Dry Glades, Lodgepole Pine Forest

**Soil Profile Description**

<b>Surface Soil</b>	0-7" brown gravelly and very gravelly sandy loam, weak medium subangular blocky structure, 30-35% gravel, slightly acid.	0-14" grayish brown stratified deposits of coarse sandy loam and silt loam, weak coarse subangular blocky structure, neutral.
<b>Subsoil</b>	7-40" brown gravelly sandy loam to light yellowish brown gravelly fine sandy loam, medium and coarse subangular blocky structure, 25-30% gravel, slightly to medium acid.	
<b>Substratum</b>	40-60" very pale brown gravelly sandy loam, moderate medium and coarse subangular blocky structure, 30% gravel, strongly acid.	14-40" brown stratified silt loam and fine sandy loam with many distinct yellowish brown mottles, weak medium subangular blocky structure, neutral. 48+" saturated light gray mottled silt loam, massive, neutral.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	6	6
<b>Adapted Species Group</b>	LPP	LPP, GL
<b>Soil Erodibility</b>	Low	Moderate
<b>AWC for Profile Depth</b>	3.6-5.4	7.8-10.1
<b>AWC for Surface 24"</b>	1.9-2.3	3.1-4.0
<b>Seedling Survival Potential</b>	Low-Moderate	Low
<b>Plantability Potential</b>	Moderate-High	Moderate-High
<b>Hydrologic Soil Group</b>	B	C
<b>Potential for Roadbed Damage</b>	High	High

**Inclusions (10%)** Germany family, deep

**Remarks:** Includes poorly drained to well drained phases, adapted species are limited by seasonal high water table, natural regeneration of lodgepole pine out competes planted ponderosa pine seedlings.

**240 Ovall, ponded-Morical families-Aquic Xerorthents complex, 0 to 5 percent slopes**

Map Unit Components	<b>Ovall family, ponded (35%)</b>	<b>Morical family (25%)</b>	<b>Aquic Xerorthents (20%)</b>
Geomorphic Position	Outwash flats and terraces.	Outwash terraces, alluvial flats.	Level dry lake beds, outwash flats and terraces.
Typical Vegetation Series	Lodgepole Pine Forest	Upper Montane Dry Meadows	Low to Mid Montane Sedge Grass Meadows

**Soil Profile Description**

Surface Soil	0-7" brown gravelly and very gravelly sandy loam, weak medium subangular blocky structure, 30-35% gravel, slightly acid.	0-6" dark brown sandy clay loam, weak medium subangular blocky structure, 10% gravel, medium acid.	0-30" brown silt loam and light yellowish brown loam, weak medium subangular blocky structure, neutral.
Subsoil	7-40" brown gravelly sandy loam to light yellowish brown gravelly fine sandy loam, medium and coarse subangular blocky structure, 25-30% gravel, slightly to medium acid.	6-27" dark yellowish brown and strong brown sandy clay loam, strong medium and coarse subangular blocky structure, 15% gravel, neutral.	27-44" strong brown sandy clay loam, moderate medium and coarse subangular blocky structure, 5% gravel, neutral.
Substratum	40-60" very pale brown gravelly sandy loam, moderate medium and coarse subangular blocky structure, 30% gravel, strong acid.	27-44" strong brown sandy clay loam, moderate medium and coarse subangular blocky structure, 5% gravel, neutral.	30-46" yellowish brown light clay loam, strong medium subangular blocky structure, neutral. 46-60" light yellowish brown loamy sand, single grain, neutral.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	5	5	6
Adapted Species Group	DF, PP, SP, WF	P, BL, GL, LPP	LPP
Soil Erodibility	Moderate	High	Low
AWC for Profile Depth	2.1-3.1	6.5-7.8	3.6-5.4
AWC for Surface 24"	1.1-1.9	3.0-4.3	1.9-2.3
Seedling Survival Potential	Low-Moderate	Low-Moderate	Low-Moderate
Plantability Potential	Moderate-High	Moderate-High	Moderate-High
Hydrologic Soil Group	A	D	B
Potential for Roadbed Damage	Moderate	High	High
Inclusions (20%)	Germany family Germany family, deep		
Remarks:	Includes poorly drained to well drained phases, adapted species are limited by seasonal high water table, natural regeneration of lodgepole pine out competes planted ponderosa pine seedlings.		

**241 Parks family-Rubble land complex, 50 to 80 percent slopes**

Map Unit Components	<b>Parks family (45%)</b>	<b>Rubble land (30%)</b>
Geomorphic Position	Steep to very steep, dissected linear slopes.	Complexed on similar position as Parks family.
Typical Vegetation Series	Jeffrey Pine Mixed Conifer Forest, Klamath Enriched Mixed Conifer Forest	Rock Rubble Rock Outcrop

**Soil Profile Description**

Surface Soil	0-13" yellowish red gravelly and very gravelly sandy clay loam, moderate very fine granular structure, 40-50% gravel and cobbles, neutral.
Subsoil	13-24" strong brown very gravelly sandy clay loam, moderate medium and fine subangular blocky structure, 40% gravel and cobbles, neutral.
Substratum	24-44" strong brown and reddish yellow very gravelly heavy sandy loam, massive to weak fine and medium subangular blocky structure, 40-50% gravel and cobbles, neutral to mildly alkaline. 44-62" highly fractured and weathered ultramafic rock.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	5-6
Adapted Species Group	JP, WWF, WF
Soil Erodibility	Low
AWC for Profile Depth	2.3-5.2
AWC for Surface 24"	1.9-2.6
Seedling Survival Potential	Low-Moderate
Plantability Potential	V. Low
Hydrologic Soil Group	B <span style="float: right;">D</span>
Potential for Roadbed Damage	Moderate <span style="float: right;">Low</span>
Inclusions (25%)	Soils similar to Parks family with <35% rock fragments Toadlake family Gozem family Rock outcrop
Remarks:	Ca/Mg imbalance limits species and growth on soils from ultramafics.

**242 Parks-Toadlake families complex, 40 to 60 percent slopes**

Map Unit Components

**Parks family (45%)**

**Toadlake family (30%)**

Geomorphic Position

Steep, simple, slightly dissected, slightly convex, smooth mountain sideslopes.

Similar position as Parks Parks family.

Typical Vegetation Series

Mixed Upper Montane Coniferous Forest, White Fir Forest

Similar Vegetation as Parks family

**Soil Profile Description**

Surface Soil

0-13" yellowish red gravelly and very gravelly sandy clay loam, moderate very fine granular structure, 40-50% gravel and cobbles, neutral.

0-10" grayish brown and light gray very gravelly loam, moderate very fine granular and very fine subangular blocky structure, 35-45% gravel and cobbles, slightly acid to neutral.

Subsoil

13-24" strong brown very gravelly sandy clay loam, moderate medium and fine subangular blocky structure, 40% gravel and cobbles, neutral.

10-56" light brownish gray very gravelly sandy clay loam to light yellowish brown very gravelly clay loam, moderate fine to weak coarse subangular blocky structure, 45-50% gravel and cobbles, mildly alkaline.

Substratum

24-44" strong brown and reddish yellow very gravelly heavy sandy loam, massive to weak fine and medium subangular blocky structure, 40-50% gravel and cobbles, neutral to mildly alkaline.  
44-62" highly fractured and weathered ultramafic rock.

56-59" hard, moderately fractured ultramafic rock.

**Soil Properties & Management Interpretations**

Forest Survey Site Class

5-6

5-6

Adapted Species Group

JP, WWF, WF

JP, WWP, WF

Soil Erodibility

Low

Moderate

AWC for Profile Depth

2.3-5.2

2.5-5.0

AWC for Surface 24"

1.9-2.6

2.3-3.0

Seedling Survival Potential

Low-Moderate

Moderate

Plantability Potential

High-Low

High-Low

Hydrologic Soil Group

B

B

Potential for Roadbed Damage

Moderate

Moderate

Inclusions (25%)

Soils similar to Parks family with <35% gravels  
Tamflat family  
Rubble land

Remarks:

Parks and Toadlake limitations: Ca/Mg imbalance limits species and growth on soils from ultramafics.

**243 Parrish family, 20 to 50 percent slopes**

Map Unit Components	<b>Parrish family (75%)</b>
Geomorphic Position	Moderately steep mountain sideslopes.
Typical Vegetation Series	Chamise Chaparral Low & Foothill Mixed Chaparral

**Soil Profile Description**

Surface Soil	0-9" brown loam or heavy loam, weak and medium subangular blocky structure, 5% gravel, slightly acid.
Subsoil	9-30" strong brown clay loam, weak moderate subangular blocky structure, 5% gravel, slightly acid.
Substratum	30-34" highly fractured, slightly weathered metasedimentary rock.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	6-7
Adapted Species Group	BL, PP
Soil Erodibility	Moderate
AWC for Profile Depth	4.0-6.0
AWC for Surface 24"	3.6-4.6
Seedling Survival Potential	Low
Plantability Potential	High
Hydrologic Soil Group	C
Potential for Roadbed Damage	High
Inclusions (25%)	Goulding family Stonyford family Henneke family Secca family Neuns family

Remarks:

**244 Parrish-Goulding families complex, 20 to 60 percent slopes**

<b>Map Unit Components</b>	<b>Parrish family (60%)</b>	<b>Goulding family (30%)</b>
<b>Geomorphic Position</b>	Moderate steep to steep, dissected mountain sideslopes.	Steep, dissected mountain sideslopes.
<b>Typical Vegetation Series</b>	Chamise Chaparral Low Montane & Foothill Mixed Chaparral	Chamise Chaparral Low Montane & Foothill Mixed Chaparral

**Soil Profile Description**

<b>Surface Soil</b>	0-9" brown loam or heavy loam, weak and medium subangular blocky structure, 5% gravel, slightly acid.	0-7" yellowish brown very gravelly loam, moderate medium subangular blocky structure, 40% gravel and cobbles, neutral.
<b>Subsoil</b>	9-30" strong brown clay loam, weak moderate subangular blocky structure, 5% gravel, slightly acid.	7-15" yellowish brown very gravelly loam, moderate medium subangular blocky structure, 55% gravel and cobbles, neutral.
<b>Substratum</b>	30-34" highly fractured, slightly weathered metasedimentary rock.	15-20" fractured metavolcanic rock.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	6-7	7
<b>Adapted Species Group</b>	BL, PP	BL
<b>Soil Erodibility</b>	Moderate	Moderate
<b>AWC for Profile Depth</b>	4.0-6.0	0.7-1.9
<b>AWC for Surface 24"</b>	3.6-4.6	0.7-1.9
<b>Seedling Survival Potential</b>	Low	V. Low
<b>Plantability Potential</b>	Moderate-High	V. Low-Low
<b>Hydrologic Soil Group</b>	C	D
<b>Potential for Roadbed Damage</b>	High	Low
<b>Inclusions (10%)</b>	Stonyford family Rock outcrop, metamorphic	
<b>Remarks:</b>		

## 245 Redcap family, 25 to 50 percent slopes

Map Unit Components	<b>Redcap family (80%)</b>
Geomorphic Position	Steep mountain sideslopes in proximity to pumice cones.
Typical Vegetation Series	Red Fir Forest Lodgepole Pine Forest

### Soil Profile Description

Surface Soil	0-24" light brownish gray cindery loamy coarse sand, single grain, 30-40% gravel size pumice cinders slightly acid.
Subsoil	
Substratum	24-60" light gray very gravelly sandy loam, weak medium subangular blocky structure, 40-60% gravel and cobbles, slightly acid. 60-62" semi-consolidated glacial till.

### Soil Properties & Management Interpretations

Forest Survey Site Class	5
Adapted Species Group	RF, JP, WWP
Soil Erodibility	Low
AWC for Profile Depth	5.7-7.2
AWC for Surface 24"	3.6-4.6
Seedling Survival Potential	Low-Moderate
Plantability Potential	High
Hydrologic Soil Group	B
Potential for Roadbed Damage	High
Inclusions (20%)	Yallani family, pumice overburden phase Rock outcrop

**Remarks:** Despite the high AWC values for pumice soils, the potential for regeneration is limited. The most limiting factor is the depth of pumice. Repeated attempts at establishing seedlings in pumice have been unsuccessful; it appears necessary for the roots to reach finer textured material beneath. High albedo, adverse thermal properties and very low inherent fertility are additional limiting factors for regeneration on pumice soils.

## 246 Revit family, 10 to 40 percent slopes

Map Unit Components	<b>Revit family (80%)</b>
Geomorphic Position	Moderately steep mountain sideslopes.
Typical Vegetation Series	Sierran-Cascade Mixed Conifer Forest, Red Fir - White Fir Forest

### Soil Profile Description

Surface Soil	0-20" very dark grayish brown to dark grayish brown fine sandy loam weak fine granular to weak medium angular blocky structure, 0-14% gravel, strongly to medium acid.
Subsoil	20-36" brown cobbly loamy fine sand, weak medium subangular blocky structure, 30-35% gravel, medium to strongly acid.
Substratum	36-40" fractured vesicular basalt.

### Soil Properties & Management Interpretations

Forest Survey Site Class	4
Adapted Species Group	WF, RF, JP
Soil Erodibility	Low
AWC for Profile Depth	3.2-5.2
AWC for Surface 24"	2.4-2.8
Seedling Survival Potential	Moderate
Plantability Potential	High
Hydrologic Soil Group	B
Potential for Roadbed Damage	High
Inclusions (20%)	Sheld family Yallani family
Remarks:	Mapped on glacial deposits and scaria as well as basalt andesite. High albedo, adverse thermal properties and very low inherent fertility are additional limiting factors for regeneration on pumice soils.

**247 Revit-Sheld families complex, 15 to 45 percent slopes**

**Map Unit Components**

**Revit family (60%)**

**Sheld family (30%)**

**Geomorphic Position**

Gently sloping mountain sideslopes.

Gentle to steep mountain sideslopes.

**Typical Vegetation Series**

Sierran-Cascade Mixed Conifer Forest, Red Fir - White Fir Forest

Snowbrush Chaparral Red Fir - White Fir Forest  
Sierran-Cascade Mixed Conifer Forest

**Soil Profile Description**

**Surface Soil**

0-20" very dark grayish brown to dark grayish brown fine sandy loam weak fine granular to weak medium angular blocky structure, 0-14% gravel, strongly to medium acid.

0-11" dark brown gravelly coarse sandy loam to brown gravelly sandy loam, single grain, 25% gravel and cobbles, slightly acid.

**Subsoil**

20-36" brown cobbly loamy fine sand, weak medium subangular blocky structure, 30-35% gravel, medium to strongly acid.

11-42" dark yellowish brown and brown extremely cobbly fine sandy loam, weak to strong medium subangular blocky structure, 75% cobbles, stones and gravel, slightly acid.

**Substratum**

36-40" fractured vesicular basalt.

42-44" consolidated glacial till.

**Soil Properties & Management Interpretations**

**Forest Survey Site Class**

4

5

**Adapted Species Group**

WF, RF, JP

WF, RF, JP, WWP

**Soil Erodibility**

Low

Low

**AWC for Profile Depth**

3.2-5.2

1.5-3.2

**AWC for Surface 24"**

2.4-2.8

1.0-2.2

**Seedling Survival Potential**

Moderate

Low-Moderate

**Plantability Potential**

High

V. Low-Low

**Hydrologic Soil Group**

B

B

**Potential for Roadbed Damage**

High

Low

**Inclusions (10%)**

Rock outcrop, volcanic  
Yallani family  
Cinder talus

**Remarks:**

Mapped on glacial deposits and scaria as well as basalt andesite. High albedo, adverse thermal properties and very low inherent fertility are additional limiting factors for regeneration on pumice soils.

## 248 Rock outcrop, basic intrusive

### Map Unit Components

### Rock outcrop (80%)

### Geomorphic Position

Steep to very steep, on ridges, summits, and upper slopes. Commonly including headwalls and thresholds of glacial cirques, and glacial aretes and horns.

### Typical Vegetation Series

Rock Outcrop Scree/Shrub

## Soil Profile Description

Outcrops designated as basic intrusive include bedrock outcrops of gabbro, diorite, and minor quartz diorite. These occur as small to relatively large bodies associated with a massive ultramafic sheet in the upper Sacramento and Trinity River drainages, principally along the divide. They range from China Mt. in the north the Bonanza King in the south.

The rock mass is generally competent, but physical weathering by frost wedging, and plucking associated with glacial activity, have left the surface irregular and scarred with crevices, ledges, and surface fracturing. Fragments as well as bedrock tends to be hard and only slightly weathered chemically. Both rock types are characteristically moderate to coarse textured. Gabbro tends to be a more common component than diorite.

## Soil Properties & Management Interpretations

### Forest Survey Site Class

### Adapted Species Group

### Soil Erodibility

### AWC for Profile Depth

### AWC for Surface 24"

### Seedling Survival Potential

### Plantability Potential

### Hydrologic Soil Group

D

### Potential for Roadbed Damage

Low

### Inclusions (20%)

Rubble land  
Skymor family  
Endlich family

### Remarks:

## 249 Rock outcrop, granitic

Map Unit Components

### Rock outcrop (80%)

Geomorphic Position

Steep to very steep, craggy ridges and peaks (including glacial headwalls and aretes) and relatively gentle broad, smooth ledges and glacial thresholds.

Typical Vegetation Series

Rock Outcrop Scree/Shrub Scree/Conifer

### Soil Profile Description

Granitic rock outcrops are found principally on the summits and ridges of various granitic plutons and smaller intrusive bodies in and adjacent to the Trinity Alps and on Castle Crag. Small areas are occasionally found in the Ironside Mountain and Chancelulla Peak granitic batholiths on the Big Bar, Hayfork and Yolla Bolla Ranger Districts. Elevation of granitic rock outcrops vary from 4,000 to 9,000 feet, being most common above 6,000 feet (except on Castle Crag).

Granitic outcrops are typically very steep and craggy. In the Trinity Alps they include aretes, headwalls, and thresholds resulting from glaciation. The rocks are quite massive but extensive surface fracturing by vertical cleavage along ridges is quite common. This results in very irregular and jagged ridges and peaks. However, there are also extensive broad ledges characterized by relatively gentle slopes that are smooth and where the principal physical weathering is by shallow exfoliation. There is little evidence of chemical weathering, and the minor associated soils are dominated by silica sand and are strongly acid.

In the vicinity of the Trinity Alps, these coarse grained igneous rocks are lithologically dominated by quartz diorite, however, composition varies in single plutons from grano diorite to diorite with small inclusions of gabbro.

### Soil Properties & Management Interpretations

Forest Survey Site Class

Adapted Species Group

Soil Erodibility

AWC for Profile Depth

AWC for Surface 24"

Seedling Survival Potential

Plantability Potential

Hydrologic Soil Group

D

Potential for Roadbed Damage

Low

Inclusions (20%)

Lithic Xerumbrepts  
Lithic Cryumbrepts  
Stecum family  
Rubble land

Remarks:

## 250 Rock outcrop, limestone

### Map Unit Components

#### Rock outcrop (90%)

### Geomorphic Position

Moderately steep to very steep, on ridges and slopes appearing as isolated islands in contrasting rocks.

### Typical Vegetation Series

Rock Outcrop Low Montane Rockland/Shrub

## Soil Profile Description

Limestone outcrops are found in both the Eastern Belt and in the Western Paleozoic and Triassic Belt of the Klamath Mountain Geomorphic Province.

Elevations range from 1,500 to 5,000 feet. The rock outcrops consist of bedded to massive, competent, crystalline, limestone which contain some fossils. They have been gradually exposed as less competent materials have eroded from around them. They are characterized by very steep to extremely steep slopes, with jagged benches and craggy ridges.

Due to the high resistance to chemical weathering in this area, the influence of these rock outcrops on soil mineralogy and reaction is restricted to the shallow inclusions on shelves of the rock outcrops and a very limited apron about the base of the outcrop.

These included are medium textured, slightly alkaline, and dominated by calcium carbonate.

## Soil Properties & Management Interpretations

### Forest Survey Site Class

### Adapted Species Group

### Soil Erodibility

### AWC for Profile Depth

### AWC for Surface 24"

### Seedling Survival Potential

### Plantability Potential

### Hydrologic Soil Group

D

### Potential for Roadbed Damage

Low

### Inclusions (10%)

Lithic calcareous soils formed from limestone

### Remarks:

**251 Rock outcrop, metamorphic**

Map Unit Components

**Rock outcrop (85%)**

Geomorphic Position

On ridges and upper slopes, including headwalls plucked by glaciers.

Typical Vegetation Series

Rock Outcrop Scree/Shrub

**Soil Profile Description**

Metamorphic rock outcrops consists of a variety of relatively old volcanic and sedimentary rocks characterizing the various lithic belts of the Klamath Mountain Province. Elevations range 2,000 to 7,000 feet. The rocks vary from weakly to strongly metamorphosed. For the most part they are extensively folded, faulted, and sheared. A broad range is evident in degree of fracturing and weathering, and rocks vary from massive to highly stratified. Typically these units are steep and highly dissected, with relatively narrow ridges. Associated soils are typically medium textured, slightly to strongly acid, and of mixed mineralogy.

**Soil Properties & Management Interpretations**

Forest Survey Site Class

Adapted Species Group

Soil Erodibility

AWC for Profile Depth

AWC for Surface 24"

Seedling Survival Potential

Plantability Potential

Hydrologic Soil Group

D

Potential for Roadbed Damage

Low

Inclusions (15%)

Skymore family  
Rubble land

Remarks:

## 252 Rock outcrop, sedimentary

Map Unit Components

### Rock outcrop (80%)

Geomorphic Position

Sharp main and spur ridges, very steep, upper mountain sideslopes.

Typical Vegetation Series

Low Montane Rockland/Shrub Low Montane Rockland/Hardwood

### Soil Profile Description

Outcrops mapped as sedimentary occur on the S-T NF principally adjacent and between Shasta and Trinity Lakes on ridges and summits of very highly dissected mountains in the Bragdon and Barid geologic formations. These mountains have sharp ridges and frequent spurs. Elevations range from 2,500 to 4,500 feet and rainfall from 60-75".

These rock outcrops are complex mixtures of slightly metamorphosed interbedded shale, sandstone, and conglomerate, and in places more highly metamorphosed slate. These rocks are commonly highly weathered and fractured. There is a general tilting of the beds to the east, though locally there is frequently complex folding. Soils are subject to raveling and shallow seated debris slides depending on the stratigraphy of the rock. When bedding planes are oriented parallel to the surface, these materials are quite unstable.

### Soil Properties & Management Interpretations

Forest Survey Site Class

Adapted Species Group

Soil Erodibility

AWC for Profile Depth

AWC for Surface 24"

Seedling Survival Potential

Plantability Potential

Hydrologic Soil Group

Potential for Roadbed Damage

Inclusions (20%)

Etsel family  
Typic Xerorthents

Remarks:

**253 Rock outcrop, volcanic**

Map Unit Components

**Rock outcrop, volcanic (70%)**

Geomorphic Position

Level to very steep lava flows.

Typical Vegetation Series

Scree Conifer Scree Scrub

**Soil Profile Description**

Volcanic rock. Includes lava flows, lava rims, craters, lava ridges, scoria deposits, outcrops on sideslopes, obsidian flows, etc.

**Soil Properties & Management Interpretations**

Forest Survey Site Class

Adapted Species Group

Soil Erodibility

AWC for Profile Depth

AWC for Surface 24"

Seedling Survival Potential

Plantability Potential

Hydrologic Soil Group

D

Potential for Roadbed Damage

Low

Inclusions (30%)

Ledmount family  
Washougal family  
Germany family  
Sheld family

Remarks:

**254 Rock outcrop-Cheadle-Behanin families complex, 30 to 80 percent slopes**

Map Unit Components	Rock outcrop (60%)	Cheadle family (20%)	Behanin family (15%)
Geomorphic Position	Summits, ridges, and cirque and thresholds.	Very steep, linear, to broken upper slopes, cirque walls and basins.	On linear upper mountain sideslopes and cirques.
Typical Vegetation Series	Rock Outcrop Rock Rubble	Chaparral	Red Fir Subalpine Woodland Mt. Hemlock Forest Mixed Subalpine Coniferous Woodland

**Soil Profile Description**

Surface Soil	0-3" very dark grayish brown gravelly fine sandy loam, weak fine and very fine granular structure, 30% gravel and cobbles, slightly acid.	0-21" very dark grayish brown cobbly sandy loam and dark grayish brown very cobbly fine sandy loam, weak fine granular and medium subangular blocky structure, 20-45% cobbles and gravel, slightly to medium acid.
Subsoil		
Substratum	3-11" dark grayish brown extremely gravelly sandy loam, weak fine and very fine granular structure or single grain, 60% gravel and cobbles, medium acid. 11-15" moderately fractured metavolcanic bedrock.	21-40" dark grayish brown very cobbly and extremely cobbly fine sandy loam, single grain to weak fine and medium subangular blocky structure, 45-70% gravel and cobbles, slightly acid.

**Soil Properties & Management Interpretations**

Forest Survey Site Class		7	5-6
Adapted Species Group		BL	WF, RF, JP
Soil Erodibility		Low	Low
AWC for Profile Depth		1.0-2.0	2.7-4.7
AWC for Surface 24"		1.1-2.1	2.3-2.8
Seedling Survival Potential		Low	Moderate
Plantability Potential		Low-V. Low	Low-V. Low
Hydrologic Soil Group	D	C-D	A-B
Potential for Roadbed Damage:	Low	Low	Moderate
Inclusions: (5%)	Typic Cryaquoll		
Remarks:	Cheadle and Behanin limitations: Extreme cold and short growing season.		

**255 Rock outcrop-Delaney family association, 0 to 10 percent slopes**

<b>Map Unit Components</b>	<b>Rock outcrop (40%)</b>	<b>Delaney family (40%)</b>
<b>Geomorphic Position</b>	Nearly level basalt lava flows.	Pockets in the irregular surface of lava flows at the base of volcanic cones.
<b>Typical Vegetation Series</b>	Sagebrush Scrub	Western Juniper Woodland Sagebrush Scrub Bitterbrush-Goldenbrush Scrub

**Soil Profile Description**

<b>Surface Soil</b>	0-14" grayish brown loamy sand to light brownish gray sand, single grain to massive, 5-10% pumice gravel, medium acid.
<b>Subsoil</b>	
<b>Substratum</b>	14-23" pale brown sand, massive, 15% gravel, neutral. 23-24" fractured unweathered basalt.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	7
<b>Adapted Species Group</b>	BL
<b>Soil Erodibility</b>	Low
<b>AWC for Profile Depth</b>	0.8-2.4
<b>AWC for Surface 24"</b>	0.9-1.5
<b>Seedling Survival Potential</b>	V. Low-Low
<b>Plantability Potential</b>	Low
<b>Hydrologic Soil Group</b>	D C
<b>Potential for Roadbed Damage</b>	Low High
<b>Inclusions (20%)</b>	Avis family Delaney family, deep
<b>Remarks:</b>	Mapped in an area of low rainfall.

**256 Rock outcrop-Dubakella-Weitchpec families complex, 40 to 60 percent slopes**

Map Unit Components	<b>Rock outcrop (45%)</b>	<b>Dubakella family (15%)</b>	<b>Weitchpec family (15%)</b>
Geomorphic Position	Highly dissected steep, linear, broken mountain sideslopes.	Complexed in similar position as rock outcrop.	Complexed in similar position as rock outcrop.
Typical Vegetation Series	Rock Outcrop	Very Open Jeffrey Pine - Incense Cedar Woodland Serpentine Chaparral	Similar vegetation as Dubakella

**Soil Profile Description**

Surface Soil	0-11" reddish brown cobbly loam and very stony clay loam, weak and moderate very fine subangular blocky structure, 30 to 50% gravel, cobbles and stones, neutral.	0-5" light gray gravelly loam, moderate fine and medium granular structure, 30% gravel, slightly acid.
Subsoil	11-18" strong brown extremely stony clay, strong fine subangular blocky structure, 65% gravels and stones, mildly alkaline.	5-25".white to pale yellow very gravelly loam, moderate fine subangular blocky structure, 35-45% gravel, slightly acid to neutral.
Substratum	18-26" strong brown extremely stony clay, massive, 85% gravel and stones, mildly alkaline, 26-30" ultramafic rock.	25-38" highly fractured ultramafic rock.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	5-6	5-6
Adapted Species Group	JP, IC, DF	JP, IC, DF
Soil Erodibility	High	Moderate
AWC for Profile Depth	1.8-4.2	2.4-4.0
AWC for Surface 24"	1.8-3.0	2.0-2.7
Seedling Survival Potential	Low-Moderate	Moderate
Plantability Potential	V. Low	V. Low
Hydrologic Soil Group	D	B
Potential for Roadbed Damage	Low	Moderate

Inclusions (25%) Rubble land  
Beaughton family

Remarks: Dubakella and Weitchpec limitations: Ca/Mg imbalance limits species and productivity.

**257 Rock outcrop-Endlich family association, 5 to 90 percent slopes**

<b>Map Unit Components</b>	<b>Rock outcrop (55%)</b>	<b>Endlich family (30%)</b>
<b>Geomorphic Position</b>	Ridge tops, cirque walls, steep to very steep, linear to broken topography.	Benches and colluvial slopes of 30 to 70% on topography as described for Rock outcrop.
<b>Typical Vegetation Series</b>	Rock Outcrop	Western White Pine Subalpine Woodland Mt. Hemlock Forest Red Fir Subalpine Woodland

**Soil Profile Description**

<b>Surface Soil</b>	0-5" dark yellowish brown very fine sandy loam and yellowish brown very gravelly sandy loam, moderate and weak very fine granular structure, 10-45% gravel and cobbles, strongly to medium acid.
<b>Subsoil</b>	5-16" yellowish brown very gravelly very fine sandy loam, weak very fine granular structure, 55% gravel and cobbles, medium acid.
<b>Substratum</b>	16-38" yellowish brown very gravelly sandy loam and very cobbly coarse sandy loam, weak medium subangular blocky structure and single grain, 40-50% gravel and cobbles, strongly acid. 38-47" moderately fractured gabbro.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	5-6
<b>Adapted Species Group</b>	WF, RF, JP
<b>Soil Erodibility</b>	Low
<b>AWC for Profile Depth</b>	1.8-3.4
<b>AWC for Surface 24"</b>	1.5-2.0
<b>Seedling Survival Potential</b>	Low
<b>Plantability Potential</b>	Low
<b>Hydrologic Soil Group</b>	D
<b>Potential for Roadbed Damage</b>	Low
<b>Inclusions (15%)</b>	Lithic Cryochrepts Skymor family Typic Cryaquolls
<b>Remarks:</b>	Endlich limitations: Extreme cold and short growing season.

**258 Rock outcrop-Fons-Sheld families association, 20 to 45 percent slopes**

Map Unit Components	Rock outcrop (45%)	Fons family (30%)	Sheld family (25%)
Geomorphic Position	Cinder cones.	Cinder cones.	Moderately steep mountain sideslopes.
Typical Vegetation Series	Scree/Conifer	Sierran-Cascade Mixed Conifer Forest	Red Fir - White Fir Forest Snowbrush Chaparral

**Soil Profile Description**

	Rock outcrop (45%)	Fons family (30%)	Sheld family (25%)
Surface Soil		0-3" dark grayish brown sandy loam, single grain, 10% gravel, slightly acid.	0-11" dark brown gravelly coarse sandy loam to brown gravelly sandy loam, single grain, 25% gravel and cobbles, slightly acid.
Subsoil		3-21" brown sandy loam, strong, coarse and medium subangular blocky structure, 20-30% gravel and cinders, slightly acid.	11-42" dark yellowish brown and brown extremely cobbly fine sandy loam, weak to strong medium subangular blocky structure, 75% cobbles, stones and gravel, slightly acid.
Substratum		21-53" brown very cindery fine sandy loam, weak medium subangular blocky structure, 60-80% cinders, gravel, and cobbles, neutral.	42-44" consolidated glacial till.

**Soil Properties & Management Interpretations**

	Rock outcrop (45%)	Fons family (30%)	Sheld family (25%)
Forest Survey Site Class		5	5
Adapted Species Group		DF, PP, SP, WF	WF, RF, JP, WWP
Soil Erodibility		Moderate	Low
AWC for Profile Depth		2.1-3.1	1.5-3.2
AWC for Surface 24"		1.1-1.9	1.0-2.2
Seedling Survival Potential		Low	Low-Moderate
Plantability Potential		Moderate-High	V. Low
Hydrologic Soil Group	D	A	B
Potential for Roadbed Damage	Low	Moderate	Low
Inclusions (10%)	Ledmount family		
Remarks:			

**259 Rock outcrop-Goulding family complex, 40 to 80 percent slopes**

<b>Map Unit Components</b>	<b>Rock outcrop (50%)</b>	<b>Goulding family (35%)</b>
<b>Geomorphic Position</b>	Highly dissected, linear, lower mountain sideslopes.	Highly dissected mountain sideslopes.
<b>Typical Vegetation Series</b>		Low Montane & Foothill Mixed Chaparral Canyon Oak Woodland

**Soil Profile Description**

<b>Surface Soil</b>	0-7" yellowish brown very gravelly loam, moderate medium subangular blocky structure, 40% gravel and cobbles, neutral.
<b>Subsoil</b>	7-15" yellowish brown very gravelly loam, moderate medium subangular blocky structure, 55% gravel and cobbles, neutral.
<b>Substratum</b>	15-20" fractured metavolcanic rock.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>		7
<b>Adapted Species Group</b>		BL
<b>Soil Erodibility</b>		Moderate
<b>AWC for Profile Depth</b>		0.7-1.9
<b>AWC for Surface 24"</b>		0.7-1.9
<b>Seedling Survival Potential</b>		V. Low-Low
<b>Plantability Potential</b>		Low
<b>Hydrologic Soil Group</b>	D	D
<b>Potential for Roadbed Damage</b>	Low	Low
<b>Inclusions (15%)</b>	Typic Xerorthents Etsel family	

**Remarks:**

**260 Rock outcrop-Gozem family complex, 60 to 80 percent slopes**

Map Unit Components	<b>Rock outcrop (45%)</b>	<b>Gozem family (30%)</b>
Geomorphic Position	Very steep sideslopes.	Very steep sideslopes.
Typical Vegetation Series	Rock outcrop Chaparral	Very open Jeffrey Pine - Incense Cedar Woodland Upper Montane Serpentine Semi-Barrens

**Soil Profile Description**

Surface Soil	0-4" yellowish brown very cobbly loam moderate fine and medium subangular blocky structure, 35% gravel and cobbles, neutral.
Subsoil	4-18" yellowish brown very cobbly and very gravelly loam, moderate to strong medium subangular blocky structure, 45 to 55% gravel and cobbles, neutral to slightly acid.
Substratum	18-22"+ highly fractured serpentinized peridotite.

**Soil Properties & Management Interpretations**

Forest Survey Site Class		7
Adapted Species Group		BL, GL
Soil Erodibility		Moderate
AWC for Profile Depth		1.5-2.4
AWC for Surface 24"		1.5-2.4
Seedling Survival Potential		V. Low-Low
Plantability Potential		V. Low-Low
Hydrologic Soil Group	D	C
Potential for Roadbed Damage	Low	Low
Inclusions (25%)	Rubble land Toadlake family	
Remarks:	Serpentine mineralogy limits adapted species and productivity.	

**261 Rock outcrop-Jayar family, 40 to 80 percent slopes**

Map Unit Components  
 Geomorphic Position  
 Typical Vegetation Series

**Rock outcrop (50%)**

Steep to very steep, upper sideslopes.

**Jayar family (30%)**

Steep sideslopes.

Red Fir - White Fir Forest Mixed Upper Montane  
 Mixed Conifer

**Soil Profile Description**

Surface Soil

0-5" light gray very gravelly sandy loam, moderate medium granular structure, 40% gravel and cobbles, medium acid.

Subsoil

5-26" light brownish gray very cobbly very fine sandy loam and light gray very cobbly loam, weak medium subangular blocky structure, 42-55% cobbles and gravel, strongly to slightly acid.

Substratum

26-36" moderately fractured unweathered basic intrusive rock.

**Soil Properties & Management Interpretations**

Forest Survey Site Class

5-6

Adapted Species Group

WF, JP, SP, DF

Soil Erodibility

Low

AWC for Profile Depth

2.0-4.0

AWC for Surface 24"

2.0-3.2

Seedling Survival Potential

Moderate

Plantability Potential

V. Low-Low

Hydrologic Soil Group

D

B

Potential for Roadbed Damage

Low

Moderate

Inclusions (20%)

Rubble land  
 Wapal family  
 Skymor family

Remarks:

Jayar family sometimes forms on compacted glacial rubble.

**262 Rock outcrop-Ledmount family complex, 0 to 20 percent slopes**

Map Unit Components	Rock outcrop (60%)	Ledmount family (30%)
Geomorphic Position	Gently sloping lava flows and ridges.	Gently sloping lava flows and ridge sideslopes.
Typical Vegetation Series	Rock Outcrop Bitterbrush - Goldenbrush Scrub Barren/Stipa	Barren/Stipa Bitterbrush - Goldenbrush Scrub

**Soil Profile Description**

Surface Soil	0-9" dark brown fine sandy loam to brown cobbly sandy loam, single grain to weak medium and coarse subangular blocky structure, 15-25% gravel and cobbles, slightly to medium acid.
Subsoil	9-13" yellowish brown cobbly sandy loam, weak medium and coarse subangular blocky structure, 25% cobbles and gravel, medium acid.
Substratum	13-14" fractured basalt bedrock.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	7
Adapted Species Group	BL
Soil Erodibility	Moderate
AWC for Profile Depth	0.9-1.1
AWC for Surface 24"	0.9-1.1
Seedling Survival Potential	V. Low-Low
Plantability Potential	V. Low-Low
Hydrologic Soil Group	D
Potential for Roadbed Damage	Low
Inclusions (10%)	Germany family Washougal family
Remarks:	Soil is formed in ash deposits on recent lava flows, lava tubes common in these units.

**263 Rock outcrop-Lithic Cryochrepts-Deadfall family complex, 20 to 70 percent slopes**

Map Unit Components	<b>Rock outcrop (40%)</b>	<b>Lithic Cryochrepts (35%)</b>	<b>Deadfall family (15%)</b>
Geomorphic Position	Complex, steep to very steep, linear, smooth to broken, ridge tops.	Position similar to that described for rock outcrop.	Position similar to that described for rock outcrop.
Typical Vegetation Series	Rock Outcrop	Upper Montane Serpentine Semi-Barren, Mt. Mahogany Scrub	Vegetation similar to that described for Lithic Cryochrepts, ultramafic

**Soil Profile Description**

Surface Soil	0-7" very pale brown gravelly sandy clay loam, moderate fine and very fine subangular blocky structure, 40% gravel, neutral.	0-14" pale brown and yellowish brown very gravelly sandy loam, moderate to weak fine and very fine granular structure, 35-45% gravel and cobbles, slightly acid to neutral.
Subsoil	7-17" pale brown very gravelly sandy clay loam, weak fine and very fine subangular blocky structure, 50% gravel, mildly alkaline.	14-24" yellowish brown extremely gravelly sandy loam, weak very fine granular structure, 75% gravel and cobbles, mildly alkaline.
Substratum	17-20" highly fractured moderately weathered ultramafic rock.	24-34" highly fractured ultramafic rock with coatings of soil. 34-40" ultramafic rock.

**Soil Properties & Management Interpretations**

Forest Survey Site Class		7	7
Adapted Species Group		GL	GL
Soil Erodibility		Low	Low
AWC for Profile Depth		0.8-2.0	0.9-1.5
AWC for Surface 24"		0.8-1.9	0.9-1.5
Seedling Survival Potential		V. Low-Low	V. Low - Low
Plantability Potential		Low-V. Low	Low-V. Low
Hydrologic Soil Group	D	D	A-B
Potential for Roadbed Damage	Low	Low	Moderate
Inclusions: (10%)	Rubble land		
Remarks:	Lithic Cryochrepts and Deadfall limitation: Ca/Mg imbalance limits species and productivity. Also extreme cold and short growing season.		

**264 Rock outcrop-Lithic Cryumbrepts complex, 50 to 80 percent slopes**

Map Unit Components	<b>Rock outcrop (60%)</b>	<b>Lithic Cryumbrepts (20%)</b>
Geomorphic Position	Dissected, very steep, linear, rough sideslopes and ridge tops.	Position similar to rock outcrop.
Typical Vegetation Series	Rock Outcrop	Chaparral

**Soil Profile Description**

Surface Soil	0-7" dark grayish brown gravelly sandy loam, weak very fine granular structure, 15% gravel, strongly acid.
Subsoil	
Substratum	7-19" dark brown very cobbly loamy sand, single grain, 50% gravel and cobbles, strongly acid. 19-21" moderately fractured granitic bedrock.

**Soil Properties & Management Interpretations**

Forest Survey Site Class		7
Adapted Species Group		BL
Soil Erodibility		Low
AWC for Profile Depth		0.6-1.5
AWC for Surface 24"		0.7-1.5
Seedling Survival Potential		V. Low-Low
Plantability Potential		V. Low
Hydrologic Soil Group	D	C-D
Potential for Roadbed Damage	Low	Moderate
Inclusions (20%)	Behanin family Lithic Cryumbrepts lacking umbric epipedons	

Remarks:

**265 Rock outcrop-Lithic Haploxeralfs-Beaughton family complex, 60 to 80 percent slopes**

Map Unit Components	Rock outcrop (55%)	Lithic Haploxeralfs (15%)	Beaughton family (15%)
Geomorphic Position	Dissected, very steep, linear, ridge tops and sideslopes.	Position similar to that described for rock outcrop.	Ridge tops and very steep mountain sideslopes.
Typical Vegetation Series	Rock Outcrop Low Montane Serpentine Semi-Barrens	Very Open (10-20%) Jeffrey Pine-Incense Cedar Woodland Low Montane Serpentine Semi-Barrens	Vegetation similar to that described as Kelsey family.

**Soil Profile Description**

Surface Soil	0-4" pale brown gravelly loam and yellowish brown very gravelly loam, moderate coarse platy and moderate medium subangular blocky structure, 20 to 35 percent gravel, slightly acid to neutral.	0-3" brown gravelly loam, weak very fine granular and subangular blocky structure, 25% gravel, and cobbles, mildly alkaline.
Subsoil	4-17" light yellowish brown very gravelly loam to yellowish brown very gravelly sandy clay loam, moderate fine, medium and coarse subangular blocky structure, 40 to 50 percent gravel, mildly to moderately alkaline.	3-16" reddish brown very cobbly clay loam and strong brown extremely cobbly clay, weak to moderate fine subangular blocky structure 50-60% gravel, cobbles and stones, mildly to moderately alkaline.
Substratum	17-24" moderately fractured serpentine rock.	16-21" highly fractured ultramafic rock.

**Soil Properties & Management Interpretations**

Forest Survey Site Class		7	7
Adapted Species Group		GL, BL	GL, BL
Soil Erodibility		Moderate	Moderate
AWC for Profile Depth		1.3-1.8	1.6-2.1
AWC for Surface 24"		1.3-1.7	1.6-1.9
Seedling Survival Potential		Low	Low
Hydrologic Soil Group	D	C-D	D-C
Potential for Roadbed Damage	Low	Low	Low
Inclusions: (15%)	Kang family Grell family		
Remarks:	Lithic Haploxeralfs and Beaughton limitations: Ca/Mg imbalance, possible toxicity, and poor aeration.		

**266 Rock outcrop-McCumber family association, 35 to 75 percent slopes**

<b>Map Unit Components</b>	<b>Rock outcrop (60%)</b>	<b>McCumber family (30%)</b>
<b>Geomorphic Position</b>	Steep to very steep lava flows.	Moderately steep to steep glacial moraines, glacial outwash channels.
<b>Typical Vegetation Series</b>	Rock Outcrop Scree/Conifer	Red Fir - White Fir Forest Red Fir Forest

**Soil Profile Description**

<b>Surface Soil</b>	0-11" grayish brown and dark grayish brown coarse sandy loam, weak very fine subangular blocky structure, 5% gravel, medium to slightly acid.
<b>Subsoil</b>	11-17" brown cobbly coarse sandy loam, weak fine subangular blocky structure, 25% cobbles and gravel, slightly acid.
<b>Substratum</b>	17-43" brown and pale brown very cobbly loamy sand, weak medium subangular blocky structure, 45% gravel and cobbles, slightly acid. 43-45" compacted glacial till.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>		4
<b>Adapted Species Group</b>		WF, RF, JP
<b>Soil Erodibility</b>		Moderate
<b>AWC for Profile Depth</b>		1.2-2.5
<b>AWC for Surface 24"</b>		0.7-1.6
<b>Seedling Survival Potential</b>		V. Low-Low
<b>Plantability Potential</b>		Moderate
<b>Hydrologic Soil Group</b>	D	A
<b>Potential for Roadbed Damage</b>	Low	Moderate
<b>Inclusions (10%)</b>	Sheld family Rubble land	

**Remarks:**

**267 Rock outcrop-Nanny family association, 60 to 100 percent slopes**

<b>Map Unit Components</b>	<b>Rock outcrop (70%)</b>	<b>Nanny family (15%)</b>
<b>Geomorphic Position</b>	Very steep ridges and slope faces.	Very steep, dissected, linear mountain slopes and benches.
<b>Typical Vegetation Series</b>		Mixed Subalpine Coniferous Woodland

**Soil Profile Description**

<b>Surface Soil</b>	0-13" black very cobbly fine sandy loam, moderate very fine granular structure 55% gravel and cobbles, medium acid.
<b>Subsoil</b>	13-29" yellowish brown extremely gravelly sandy loam, weak fine subangular blocky structure, 70% gravel and cobbles, slightly acid.
<b>Substratum</b>	29-48" pale brown extremely cobbly loamy sand, single grain, 70-80% gravel and cobbles, slightly acid. 48-60" gravel and cobbles with sand in voids.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>		5
<b>Adapted Species Group</b>		WF, JP, SP
<b>Soil Erodibility</b>		Low
<b>AWC for Profile Depth</b>		2.0-3.5
<b>AWC for Surface 24"</b>		1.4-2.4
<b>Seedling Survival Potential</b>		Low-Moderate
<b>Plantability Potential</b>		V. Low
<b>Hydrologic Soil Group</b>	D	A
<b>Potential for Roadbed Damage</b>	Low	Moderate
<b>Inclusions (15%)</b>	Lithic Xerumbrepts Rubble land	
<b>Remarks:</b>		

**268 Rock outcrop-Neuns family association, 60 to 80 percent slopes**

Map Unit Components	<b>Rock outcrop (50%)</b>	<b>Neuns family (30%)</b>
Geomorphic Position	Very steep sideslopes.	Lower colluvial slopes of topography as describes for rock outcrop.
Typical Vegetation Series	Low Montane Rockland/Hardwood	Douglas-fir-Pine Canyon Oak Forest Mixed Conifer - Black Oak Forest

**Soil Profile Description**

Surface Soil	0-11" brown to light brown very gravelly sandy loam, weak to moderate medium granular structure, 35-45% gravel, slightly acid.
Subsoil	11-23" light brown very gravelly sandy loam, moderate fine subangular blocky structure, 55% gravel and cobbles, slightly acid.
Substratum	23-34" highly fractured, slightly weathered metamorphic rock.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	5
Adapted Species Group	DF, PP, SP
Soil Erodibility	Low
AWC for Profile Depth	2.3-4.8
AWC for Surface 24"	1.6-3.2
Seedling Survival Potential	Low-Moderate
Plantability Potential	Low
Hydrologic Soil Group	D
Potential for Roadbed Damage	Low
Inclusions (20%)	Typic Xerorthents Deadwood family Rubble land

Remarks:

**269 Rock outcrop-Sheld family association, 60 to 80 percent slopes**

Map Unit Components	Rock outcrop (40%)	Sheld family (40%)
Geomorphic Position	Very steep, lava flows on volcanic peaks.	Very steep mountain sideslopes.
Typical Vegetation Series	Scree/Scrub	Scree/Scrub Scree/Conifer

**Soil Profile Description**

Surface Soil	0-11" dark brown gravelly coarse sandy loam to brown gravelly sandy loam, single grain, 25% gravel and cobbles, slightly acid.
Subsoil	11-42" dark yellowish brown and brown extremely cobbly fine sandy loam, weak to strong medium subangular blocky structure, 75% cobbles, stones and gravel, slightly acid.
Substratum	42-44" consolidated glacial till.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	5
Adapted Species Group	WF, RF, JP, WWP
Soil Erodibility	Low
AWC for Profile Depth	1.5-3.2
AWC for Surface 24"	1.0-2.2
Seedling Survival Potential	Low-Moderate
Plantability Potential	V. Low-Low
Hydrologic Soil Group	D
Potential for Roadbed Damage	Low

Inclusions (20%)  
 Revit family  
 Andic Cryumbrepts  
 Rubble land

Remarks: Rock outcrop includes extremely cobbly glacial moraines and deposits of tuff breccia and welded tuffs.

**270 Rock outcrop-Skymor family complex, 30 to 90 percent slopes**

<b>Map Unit Components</b>	<b>Rock outcrop (60%)</b>	<b>Skymor family (30%)</b>
<b>Geomorphic Position</b>	Steep to very steep, ridge tops.	Steep to very steep slopes on topography as described for rock outcrop. Scree slopes.
<b>Typical Vegetation Series</b>	Scree/Forb-grass	Chaparral Very Open Mixed Upper Montane Coniferous Forest

**Soil Profile Description**

<b>Surface Soil</b>	0-3" brown extremely cobbly sandy loam, single grain 65% gravel, cobbles and stones, slightly acid.
<b>Subsoil</b>	3-17" yellowish brown extremely stony sandy loam and very pale brown extremely cobbly loam, weak fine and moderate medium subangular blocky structure, 65% gravel, cobbles and stones, medium and strongly acid.
<b>Substratum</b>	17-19" fractured basic igneous rock.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	6-7
<b>Adapted Species Group</b>	BL, WF, JP, SP
<b>Soil Erodibility</b>	Low
<b>AWC for Profile Depth</b>	0.9-2.0
<b>AWC for Surface 24"</b>	0.9-1.7
<b>Seedling Survival Potential</b>	V. Low-Low
<b>Plantability Potential</b>	V. Low-Low
<b>Hydrologic Soil Group</b>	D C-D
<b>Potential for Roadbed Damage</b>	Low Low
<b>Inclusions (10%)</b>	Jayar family
<b>Remarks:</b>	On many units Skymor is eroded and has a gravel pavement.

**271 Rock outcrop-Skymor-Tallac families association, 60 to 80 percent slopes**

Map Unit Components	Rock outcrop (35%)	Skymor family (20%)	Tallac family (20%)
Geomorphic Position	Very steep ridge tops.	Very steep, linear mountain midslopes.	Very steep linear, lower colluvial slopes.
Typical Vegetation Series		Chaparral Upper Montane Mixed Chaparral	White Fir Forest

**Soil Profile Description**

Surface Soil	0-3" brown extremely cobbly sandy loam, single grain 65% gravel, cobbles and stones, slightly acid.	0-2" very dark grayish brown very gravelly loam, weak fine granular structure, 40% gravel, slightly acid.
Subsoil	3-17" yellowish brown extremely stony sandy loam and very pale brown extremely cobbly loam, weak fine and moderate medium subangular blocky structure, 65% gravel, cobbles and stones, medium and strongly acid.	2-11" dark brown very gravelly loam, moderate medium subangular blocky structure, 40% gravel, very strongly acid.
Substratum	17-19" fractured basic igneous rock.	11-24" brown extremely cobbly loam, moderate medium subangular blocky structure, 80% cobbles and gravel, strongly acid. 24-30" highly fractured, slightly weathered schist.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	6-7	5-6
Adapted Species Group	BL, WF, JP, SP	WF, JP, SP
Soil Erodibility	Low	Low
AWC for Profile Depth	0.9-2.0	1.9-4.8
AWC for Surface 24"	0.9-1.7	1.7-2.6
Seedling Survival Potential	V. Low-Low	Low-Moderate
Plantability Potential	Low	Low
Hydrologic Soil Group	D	C-D
Potential for Roadbed Damage	Low	Low
Inclusions (25%)	Nanny family Rubble land	Moderate

Remarks:

**272 Rock outcrop-Stecum family complex, 60 to 90 percent slopes**

Map Unit Components	<b>Rock outcrop (60%)</b>	<b>Stecum family (25%)</b>
Geomorphic Position	Very steep, ridge tops, cirque headwalls.	Topography as described for rock outcrop.
Typical Vegetation Series		Western White Pine Subalpine Woodland Red Fir Subalpine Woodland

**Soil Profile Description**

Surface Soil		0-5" light olive brown very stony loamy sand, weak fine granular structure, 55% stones and gravel, slightly acid.
Subsoil		
Substratum		5-31" light olive brown extremely stony and olive yellow very stony loamy sand, weak fine and medium subangular blocky structure to massive, 50-70% stones and gravel, slightly acid.

**Soil Properties & Management Interpretations**

Forest Survey Site Class		6-7
Adapted Species Group		BL, RF, JP, WWP
Soil Erodibility		Low
AWC for Profile Depth		1.0-1.8
AWC for Surface 24"		0.7-1.8
Seedling Survival Potential		Low
Plantability Potential		V. Low
Hydrologic Soil Group	D	A
Potential for Roadbed Damage	Low	Moderate
Inclusions (15%)	Lithic Cryumbrepts Rubble land	
Remarks:	Stecum limitation: Extreme cold and short growing season.	

**273 Rock outcrop-Washougal family association, 0 to 35 percent slopes**

<b>Map Unit Components</b>	<b>Rock outcrop (60%)</b>	<b>Washougal family (30%)</b>
<b>Geomorphic Position</b>	Ridge tops, recent lava flows.	Ridge tops amid recent flows.
<b>Typical Vegetation Series</b>	Scree Conifer	Ponderosa Pine Forest Upper Montane Mixed Chaparral

**Soil Profile Description**

<b>Surface Soil</b>	0-10" dark brown gravelly loam and very cobbly fine sandy loam, weak fine subangular blocky structure, 15 to 65% cobbles and gravel, neutral to slightly acid.
<b>Subsoil</b>	10-30" brown extremely cobbly fine sandy loam, weak very fine subangular blocky structure, 70% cobbles and gravel, neutral.
<b>Substratum</b>	30-32" fractured basalt.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	5
<b>Adapted Species Group</b>	PP
<b>Soil Erodibility</b>	Moderate
<b>AWC for Profile Depth</b>	1.6-3.4
<b>AWC for Surface 24"</b>	1.4-2.3
<b>Seedling Survival Potential</b>	Low-Moderate
<b>Plantability Potential</b>	V. Low-Low
<b>Hydrologic Soil Group</b>	D
<b>Potential for Roadbed Damage</b>	Low
<b>Inclusions (10%)</b>	Neer family Germany family

**Remarks:** Usually occurs on fault scarps, Washougal family, moderately deep is mapped as McCarthy series on adjacent Soil-Veg. survey, regeneration potential is dependent on depth of ashy overburden.

**274 Rock outcrop-Washougal family, deep, association, 0 to 40 percent slopes**

Map Unit Components	<b>Rock outcrop (60%)</b>	<b>Washougal family, deep (30%)</b>
Geomorphic Position	Gently sloping lava flows.	Gently sloping glacial outwash channels and sideslopes.
Typical Vegetation Series	Scree/Scrub	Mixed Upper Montane Coniferous Forest Snowbrush Chaparral

**Soil Profile Description**

Surface Soil	0-26" dark brown sandy loam to brown extremely cobbly sandy loam, single grain, 10-65% gravel and cobbles, slightly acid to neutral.
Subsoil	26-36" yellowish brown extremely cobbly cobbly coarse sandy loam, single grain, 75% gravel and cobbles, neutral.
Substratum	36-60" gray and light gray extremely cobbly, loamy coarse sand, single grain, slightly acid to neutral.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	4
Adapted Species Group	PP, WF, JP, SP
Soil Erodibility	Moderate
AWC for Profile Depth	4.4-6.3
AWC for Surface 24"	1.4-2.3
Seedling Survival Potential	Low-Moderate
Plantability Potential	V. Low-Moderate
Hydrologic Soil Group	D
Potential for Roadbed Damage	Low
Inclusions (10%)	Shasta family McCumber family
Remarks:	Rock outcrop includes extremely cobbly glacial moraines and andesite flows.

**275 Rock outcrop-Yallani family, pumice overburden association, 45 to 75 percent slopes**

Map Unit Components	<b>Rock outcrop (60%)</b>	<b>Yallani family, pumice overburden (30%)</b>
Geomorphic Position	On ridges and peaks.	Steep to very steep slopes of mountain sideslopes.
Typical Vegetation Series		Chaparral

**Soil Profile Description**

Surface Soil	0-17" brown and very pale brown very cindery and extremely cindery coarse sandy loam, single grain, 40-70% gravel size pumice cinders, slightly acid. 17-28" brown cobbly fine sandy loam, weak medium subangular blocky structure, 35% gravel, cobbles and stones, neutral.
Subsoil	28-46" brown very cobbly fine sandy loam, moderate medium subangular blocky structure, 35% gravel, cobbles and stones.
Substratum	46-50" broken basalt bedrock.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	5
Adapted Species Group	WF, RF, JP, LLP
Soil Erodibility	Low
AWC for Profile Depth	4.0-5.0
AWC for Surface 24"	3.0-3.8
Seedling Survival Potential	Low
Plantability Potential	Moderate-High
Hydrologic Soil Group	D
Potential for Roadbed Damage	Low
Inclusions (10%)	Sheld

**Remarks:** Depth of pumice overburden determines suitability for artificial regeneration. Despite the high AWC values for pumice soils, the potential for regeneration is limited. The most limiting factor is the depth of pumice. Repeated attempts at establishing seedlings in pumice have been unsuccessful; it appears necessary for the roots to reach finer textured material beneath.

High albedo, adverse thermal properties and very low inherent fertility are additional limiting factors for regeneration on pumice soils.

**276 Rock outcrop, ultramafic-Rubble land association, 60 to 80 percent slopes**

Map Unit Components	<b>Rubble land (60%)</b>	<b>Rock outcrop (30%)</b>
Geomorphic Position	Complex, undissected, very steep, linear, rough cirque headwalls and talus slopes.	Ridge tops including glacial aretes and horns.
Typical Vegetation Series	Rock rubble	

**Soil Profile Description**

Surface Soil  
Subsoil  
Substratum

**Soil Properties & Management Interpretations**

Forest Survey Site Class		
Adapted Species Group		
Soil Erodibility		
AWC for Profile Depth		
AWC for Surface 24"		
Seedling Survival Potential		
Plantability Potential		
Hydrologic Soil Group	D	D
Potential for Roadbed Damage	Low	Low
Inclusions (10%)	Deadfall family Lithic Cryochrepts	
Remarks:		

## 277 Rogue family, 40 to 70 percent slopes

Map Unit Components	<b>Rogue family (80%)</b>
Geomorphic Position	Highly dissected, steep, mountain sideslopes.
Typical Vegetation Series	Klamath Enriched Mixed Conifer, White Fir Forest Red Fir-White Fir Forest

### Soil Profile Description

Surface Soil	0-14" brown sandy loam and light brown loamy sand, weak very fine granular structure, 0-5% gravel, slightly to medium acid.
Subsoil	14-28" very pale brown sandy loam, weak medium subangular blocky structure, 5% gravel, medium acid.
Substratum	28-65" light gray and white massive, 7-10% gravel, strongly acid. 65-70" very highly weathered granitic rock (guss).

### Soil Properties & Management Interpretations

Forest Survey Site Class	3-5
Adapted Species Group	WF, JP, SP, DF
Soil Erodibility	Moderate
AWC for Profile Depth	3.3-6.0
AWC for Surface 24"	2.3-3.3
Seedling Survival Potential	Moderate-High
Plantability Potential	High-Moderate
Hydrologic Soil Group	A-B
Potential for Roadbed Damage	V. High
Inclusions (20%)	Nanny family Jayar family, deep
Remarks:	

**278 Sadie-Neer families association, 0 to 20 percent slopes**

Map Unit Components	<b>Sadie family (60%)</b>	<b>Neer family (30%)</b>
Geomorphic Position	Gently sloping dissected lava flows.	Moderately steep mountain sideslopes.
Typical Vegetation Series	White Fir Forest Ponderosa Pine Forest	White Fir Forest Ponderosa Pine Forest

**Soil Profile Description**

Surface Soil	0-5" brown sandy loam, weak medium granular structure, 10% gravel, neutral.	0-9" dark brown to yellowish brown gravelly sandy loam, moderate fine granular to weak medium subangular blocky structure, 30% gravel, medium acid.
Subsoil	5-36" brown sandy loam, fine sandy loam and gravelly fine sandy loam, weak medium subangular blocky structure, 10-25% gravel and cobbles, neutral.	9-26" light yellowish brown gravelly and very gravelly sandy loam, weak medium subangular blocky structure, 35-40% gravel, medium acid.
Substratum	36-38" basalt bedrock.	26-35" extrusive igneous rock, paralithic contact.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	4	5
Adapted Species Group	PP, WF, JP, SP	PP
Soil Erodibility	Moderate	Low
AWC for Profile Depth	3.4-5.5	1.6-3.6
AWC for Surface 24"	2.2-3.0	1.4-2.1
Seedling Survival Potential	Moderate	Low-Moderate
Plantability Potential	Moderate-High	V. Low
Hydrologic Soil Group	B	B
Potential for Roadbed Damage	High	Low
Inclusions (10%)	Sadie family, deep Holland family, ashy	
Remarks:	Some portions of these units have frequent boulders, moderate limitation for site preparation implements.	

**279 Sadie family, deep, 0 to 35 percent slopes**

**Map Unit Components**  
**Geomorphic Position**  
**Typical Vegetation Series**

**Sadie family, deep (75%)**  
Gentle mountain sideslopes, lava flows.  
White Fir Forest, Ponderosa Pine Forest

**Soil Profile Description**

**Surface Soil**  
**Subsoil**  
**Substratum**

0-8" brown and very dark grayish brown sandy loam, weak medium subangular blocky structure, 5% gravel, strongly acid.  
8-53" light brown to very pale brown sandy loam, weak medium subangular blocky structure, 5-10% gravel, strongly to very strongly acid.  
53-80" light brown stony sandy loam, massive, 20% gravel and stones, very strongly acid.

**Soil Properties & Management Interpretations**

**Forest Survey Site Class**  
**Adapted Species Group**  
**Soil Erodibility**  
**AWC for Profile Depth**  
**AWC for Surface 24"**  
**Seedling Survival Potential**  
**Plantability Potential**  
**Hydrologic Soil Group**  
**Potential for Roadbed Damage**  
**Inclusions (25%)**  
**Remarks:**

4  
PP  
Moderate  
5.6-9.5  
2.3-3.8  
Moderate-High  
High  
B  
High  
Holland family, ashy  
Neer family  
Shasta family  
Mapped by Soil-Veg. survey as Ponto series in adjacent survey area.

**280 Sadie, deep-Germany families association, 0 to 20 percent slopes**

Map Unit Components	<b>Sadie family, deep (50%)</b>	<b>Germany family (30%)</b>
Geomorphic Position	Level lava flows.	Gently sloping lava flows.
Typical Vegetation Series	Ponderosa Pine Forest, Bitterbrush-Goldenbush Scrub	Bitterbrush-Goldenbush Scrub, Ponderosa Pine Forest

**Soil Profile Description**

Surface Soil	0-8" brown and very dark grayish brown sandy loam, weak medium subangular blocky structure, 5% gravel, strongly acid.	0-18" dark grayish brown and dark brown gravelly sandy loam, weak fine and medium granular structure, 15% gravel, slightly acid.
Subsoil	8-53" light brown to very pale brown sandy loam, weak medium subangular blocky structure, 5-10% gravel, strongly to very strongly acid.	18-28" brown very gravelly sandy loam, weak medium and coarse subangular blocky structure, 35% gravel, slightly acid.
Substratum	53-80" light brown stony sandy loam, massive, 20% gravel and stones, very strongly acid.	28-32" brown very gravelly sandy loam, relict rock structure, 60% gravel, slightly acid. 32-34" unweathered basalt.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	4	5
Adapted Species Group	PP	PP
Soil Erodibility	Moderate	Low
AWC for Profile Depth	5.6-9.5	2.2-3.2
AWC for Surface 24"	2.3-3.8	2.5-3.4
Seedling Survival Potential	Moderate-High	Moderate-High
Plantability Potential	High	High
Hydrologic Soil Group	B	B
Potential for Roadbed Damage	High	High

Inclusions (20%)  
 Shasta family  
 Germany family, deep  
 Neer family  
 Rock outcrop, volcanic

Remarks: Mapped as Ponto-Nikal association by Soil-Veg. survey in adjacent survey area.

**281 Sadie, deep-Holland, ashy families complex, 0 to 30 percent slopes**

<b>Map Unit Components</b>	<b>Sadie family, deep (60%)</b>	<b>Holland family, ashy (30%)</b>
<b>Geomorphic Position</b>	Level to gently sloping lava flows.	Gently sloping mountain sideslopes.
<b>Typical Vegetation Series</b>	Sierran-Cascade Mixed Conifer, White Fir Forest, Bitterbrush - Goldenbush Scrub	Sierran-Cascade Mixed Conifer, White Fir Forest, Bitterbrush - Goldenbush Scrub

**Soil Profile Description**

<b>Surface Soil</b>	0-8" brown and very dark grayish brown sandy loam, weak medium subangular blocky structure, 5% gravel, strongly acid.	0-13" reddish brown and yellowish red sandy loam, weak medium subangular blocky structure, 5% gravel, slightly acid.
<b>Subsoil</b>	8-53" light brown to very pale brown sandy loam, weak medium subangular blocky structure, 5-10% gravel, strongly to very strongly acid.	13-40" yellowish red sandy clay loam, moderate medium subangular blocky structure, 15 to 25% gravel, slightly acid.
<b>Substratum</b>	53-80" light brown stony sandy loam, massive, 20% gravel and stones, very strongly acid.	40-41" paralithic contact with metasediments or volcanic rock.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	4	3-4
<b>Adapted Species Group</b>	PP	PP, DF, SP, WF
<b>Soil Erodibility</b>	Moderate	High
<b>AWC for Profile Depth</b>	5.6-9.5	4.1-9.8
<b>AWC for Surface 24"</b>	2.3-3.8	2.5-3.6
<b>Seedling Survival Potential</b>	Moderate-High	Moderate-High
<b>Plantability Potential</b>	High	High
<b>Hydrologic Soil Group</b>	B	B
<b>Potential for Roadbed Damage</b>	High	High

**Inclusions (10%)**  
 Neer family  
 Germany family  
 Washougal family, deep

**Remarks:** Sadie family deep is mapped by Soil-Veg. survey as Ponto in adjacent survey area.

**282 Sadie, deep-Neer families association, 0 to 25 percent slopes**

<b>Map Unit Components</b>	<b>Sadie family, deep (60%)</b>	<b>Neer family (30%)</b>
<b>Geomorphic Position</b>	Gently sloping lava flows.	Ridge top slopes.
<b>Typical Vegetation Series</b>	Sierran-Cascade Mixed Conifer Forest, Deerbrush Transition Shrub, Bitterbrush Goldenbush Scrub	Sierran-Cascade Mixed Conifer Forest, Deerbrush Transition Shrub, Bitterbrush Goldenbush Scrub

**Soil Profile Description**

<b>Surface Soil</b>	0-8" brown and very dark grayish brown sandy loam, weak medium subangular blocky structure, 5% gravel, strongly acid.	0-9" dark brown to yellowish brown gravelly sandy loam, moderate fine granular to weak medium subangular blocky structure, 30% gravel, medium acid.
<b>Subsoil</b>	8-53" light brown to very pale brown sandy loam, weak medium subangular blocky structure, 5-10% gravel, strongly to very strongly acid.	9-26" light yellowish brown gravelly and very gravelly sandy loam, weak medium subangular blocky structure, 35-40% gravel, medium acid.
<b>Substratum</b>	53-80" light brown stony sandy loam, massive, 20% gravel and stones, very strongly acid.	26-35" extrusive igneous rock, paralithic contact.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	4	5
<b>Adapted Species Group</b>	PP	PP
<b>Soil Erodibility</b>	Moderate	Low
<b>AWC for Profile Depth</b>	5.6-9.5	1.6-3.6
<b>AWC for Surface 24"</b>	2.3-3.8	1.4-2.1
<b>Seedling Survival Potential</b>	Moderate-High	Low-Moderate
<b>Plantability Potential</b>	High	Low-Moderate
<b>Hydrologic Soil Group</b>	B	B
<b>Potential for Roadbed Damage</b>	High	Low

**Inclusions (10%)** Germany family  
Germany family, deep

**Remarks:** Mapped as Ponto-Neer association by Soil-Veg. survey in adjacent survey area.

**283 Sadie, deep-Neer families complex, 50 to 80 percent slopes**

<b>Map Unit Components</b>	<b>Sadie family, deep (55%)</b>	<b>Neer family (25%)</b>
<b>Geomorphic Position</b>	Dissected, steep to very steep, linear, mountain sideslopes.	Similar position as Sadie family.
<b>Typical Vegetation Series</b>	Sierran-Cascade Mixed Conifer Forest	Sierran-Cascade Mixed Conifer Forest

**Soil Profile Description**

<b>Surface Soil</b>	0-8" brown and very dark grayish brown sandy loam, weak medium subangular blocky structure, 5% gravel, strongly acid.	0-9" dark brown to yellowish brown gravelly sandy loam, moderate fine granular to weak medium subangular blocky structure, 30% gravel, medium acid.
<b>Subsoil</b>	8-53" light brown to very pale brown sandy loam, weak medium subangular blocky structure, 5-10% gravel, strongly to very strongly acid.	9-26" light yellowish brown gravelly and very gravelly sandy loam, weak medium subangular blocky structure, 35-40% gravel, medium acid.
<b>Substratum</b>	53-80" light brown stony sandy loam, massive, 20% gravel and stones, very strongly acid.	26-35" extrusive igneous rock, paralithic contact.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	4	5
<b>Adapted Species Group</b>	PP	PP
<b>Soil Erodibility</b>	Moderate	Low
<b>AWC for Profile Depth</b>	5.6-9.5	1.6-3.6
<b>AWC for Surface 24"</b>	2.3-3.8	1.4-2.1
<b>Seedling Survival Potential</b>	Moderate-High	Low-Moderate
<b>Plantability Potential</b>	High-Low	High-Low
<b>Hydrologic Soil Group</b>	B	B
<b>Potential for Roadbed Damage</b>	High	Low
<b>Inclusions (20%)</b>	Asta family Olete family Rock outcrop and talus, volcanic	

**Remarks:**

**284 Secca family, 20 to 50 percent slopes**

Map Unit Components	<b>Secca family (75%)</b>
Geomorphic Position	Moderately steep mountain sideslopes.
Typical Vegetation Series	Gary Oak Woodland

**Soil Profile Description**

Surface Soil	0-4" brown silt loam, moderate medium subangular blocky structure, 5% gravel, slightly acid.
Subsoil	4-28" brown and yellowish brown gravelly clay loam to gravelly clay, strong fine and medium subangular blocky structure to massive, 15 to 20% gravel, medium acid.
Substratum	28-41" yellowish brown gravelly sandy clay loam original rock structure, 30% gravel, slightly acid.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	6
Adapted Species Group	DF, PP, SP, BL
Soil Erodibility	High
AWC for Profile Depth	4.6-6.0
AWC for Surface 24"	2.3-3.2
Seedling Survival Potential	Moderate
Plantability Potential	High
Hydrologic Soil Group	C
Potential for Roadbed Damage	High
Inclusions (25%)	Hohmann family Hugo family, moderately deep Soulajule family

Remarks:

**285 Secca-Forbes families association, 20 to 40 percent slopes**

<b>Map Unit Components</b>	<b>Secca family (60%)</b>	<b>Forbes family (30%)</b>
<b>Geomorphic Position</b>	Moderately steep mountain sideslopes.	Moderately steep mountain sideslopes and benches.
<b>Typical Vegetation Series</b>	Gary Oak Woodland	Douglas-fir-Pine Mixed Conifer Forest

**Soil Profile Description**

<b>Surface Soil</b>	0-4" brown silt loam, moderate medium subangular blocky structure, 5% gravel, slightly acid.	0-8" reddish brown and yellowish red loam, strong fine granular and weak fine subangular blocky structure, 5-10% gravel, slightly acid.
<b>Subsoil</b>	4-28" brown and yellowish brown gravelly clay loam to gravelly clay, strong fine and medium subangular blocky structure to massive, 15 to 20% gravel, medium acid.	8-67" yellowish red clay to yellowish red gravelly sandy clay loam, weak coarse subangular blocky structure to massive, 13-30% gravel and cobbles, strongly acid.
<b>Substratum</b>	28-41" yellowish brown gravelly sandy clay loam original rock structure, 30% gravel, slightly acid.	

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	6	3-4
<b>Adapted Species Group</b>	DF, PP, SP, BL	DF, PP, SP
<b>Soil Erodibility</b>	High	Moderate
<b>AWC for Profile Depth</b>	4.6-6.0	7.4-9.0
<b>AWC for Surface 24"</b>	2.3-3.2	3.0-3.6
<b>Seedling Survival Potential</b>	Moderate	High
<b>Plantability Potential</b>	High	High
<b>Hydrologic Soil Group</b>	C	B
<b>Potential for Roadbed Damage</b>	High	High
<b>Inclusions (10%)</b>	Hugo family, moderately deep Soulajule family	

**Remarks:**

**286 Secca-Hugo moderately deep families complex, 20 to 40 percent slopes**

Map Unit Components	<b>Secca family (60%)</b>	<b>Hugo family, moderately deep (30%)</b>
Geomorphic Position	Moderately steep mountain sideslopes.	Moderately steep mountain sideslopes.
Typical Vegetation Series	Gary Oak Woodland	Douglas-fir-Pine Mixed Conifer Forest

**Soil Profile Description**

Surface Soil	0-4" brown silt loam, moderate medium subangular blocky structure, 5% gravel, slightly acid.	0-10" light brownish gray very gravelly heavy loam, and gravelly heavy loam, moderate and strong fine angular blocky structure, 50-33% gravel, slightly to medium acid.
Subsoil	4-28" brown and yellowish brown gravelly clay loam to gravelly clay, strong fine and medium subangular blocky structure to massive, 15 to 20% gravel, medium acid.	10-27" light yellowish brown gravelly silty clay loam, strong medium angular blocky structure, 30% gravel, strongly acid.
Substratum	28-41" yellowish brown gravelly sandy clay loam original rock structure, 30% gravel, slightly acid.	27-34" light yellowish brown gravelly clay loam, weak medium and coarse angular blocky structure, 33% gravel, very strongly acid. 34-40" slightly weathered shale.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	6	5
Adapted Species Group	DF, PP, SP, BL	DF, PP, SP
Soil Erodibility	High	High
AWC for Profile Depth	4.6-6.0	2.5-5.3
AWC for Surface 24"	2.3-3.2	2.3-3.5
Seedling Survival Potential	Moderate	High
Plantability Potential	High	High
Hydrologic Soil Group	C	C
Potential for Roadbed Damage	High	Moderate
Inclusions (10%)	Soulajule family Forbes family	

Remarks:

**287 Secca-Parrish families complex, 40 to 60 percent slopes**

<b>Map Unit Components</b>	<b>Secca family (60%)</b>	<b>Parrish family (30%)</b>
<b>Geomorphic Position</b>	Steep, highly dissected, broken lower mountain sideslopes.	Topography similar to Secca family.
<b>Typical Vegetation Series</b>	Gary Oak Woodland Digger Pine Woodland	Gary Oak Woodland Low Montane and Foothill Mixed Chaparral

**Soil Profile Description**

<b>Surface Soil</b>	0-4" brown silt loam, moderate medium subangular blocky structure, 5% gravel, slightly acid.	0-9" brown loam or heavy loam, weak medium subangular blocky structure, 5% gravel, slightly acid.
<b>Subsoil</b>	4-28" brown and yellowish brown gravelly clay loam to gravelly clay, strong fine and medium subangular blocky structure to massive, 15 to 20% gravel, medium acid.	9-30" strong brown clay loam, weak moderate subangular blocky structure, 5% gravel, slightly acid.
<b>Substratum</b>	28-41" yellowish brown gravelly sandy clay loam original rock structure, 30% gravel, slightly acid.	30-34" highly fractured, slightly weathered metasedimentary rock.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	6	6-7
<b>Adapted Species Group</b>	DF, PP, SP, BL	BL, PP
<b>Soil Erodibility</b>	High	Moderate
<b>AWC for Profile Depth</b>	4.6-6.0	4.0-6.0
<b>AWC for Surface 24"</b>	2.3-3.2	3.6-4.6
<b>Seedling Survival Potential</b>	Moderate	Low-Moderate
<b>Plantability Potential</b>	High	High
<b>Hydrologic Soil Group</b>	C	C
<b>Potential for Roadbed Damage</b>	High	High
<b>Inclusions (10%)</b>	Soils similar to Secca with >35% cobbles	
<b>Remarks:</b>		

**288 Shadeleaf-Kang families complex, 20 to 40 percent slopes**

Map Unit Components	<b>Shadeleaf family (50%)</b>	<b>Kang family (30%)</b>
Geomorphic Position	Moderately steep, dissected, broken lower mountain slopes and broad ridges.	Similar position as Shadeleaf family.
Typical Vegetation Series	Jeffrey Pine Mixed Conifer Forest	Jeffrey Pine Mixed Conifer Forest, Jeffrey Pine - Incense Cedar Woodland

**Soil Profile Description**

Surface Soil	0-4" dark grayish brown gravelly and very gravelly clay loam, moderate and strong fine granular and subangular blocky structure, 25-40% gravel, neutral to mildly alkaline.	0-6" very dark gravelly clay loam moderate fine granular to strong coarse subangular blocky structure, 10 to 25% gravel and cobbles, neutral to mildly alkaline.
Subsoil	4-23" brown very gravelly clay and pale brown gravelly clay, strong medium to weak coarse subangular blocky structure, 20-47% gravel, mildly alkaline.	6-19" very dark gray gravelly clay and olive brown very gravelly clay, strong coarse and medium subangular blocky structure, 35 to 50% gravel and cobbles, mildly alkaline.
Substratum	23-33" highly fractured and weathered ultramafic rock.	19-28" olive brown extremely cobbly clay, relict rock structure, 70% gravel and cobbles, mildly alkaline. 28-30" fractured, weathered serpentinized peridotite.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	5-6	5-7
Adapted Species Group	JP, IC, DF	JP, IC, DF
Soil Erodibility	Low	Moderate
AWC for Profile Depth	2.8-4.0	1.6-3.8
AWC for Surface 24"	2.7-3.1	2.3-2.9
Seedling Survival Potential	Moderate-High	Moderate
Plantability Potential	High-Moderate	High-Low
Hydrologic Soil Group	C	C-D
Potential for Roadbed Damage	High	Moderate
Inclusions (20%)	Dubakella family Beaughton family Dewmine family	
Remarks:	Shadeleaf limitations: Ca/Mg imbalance limits species and productivity. Kang limitations: Ca/Mg imbalance, possible toxicity and poor aeration.	

**289 Shadeleaf-Kang families complex, 40 to 70 percent slopes**

<b>Map Unit Components</b>	<b>Shadeleaf family (50%)</b>	<b>Kang family (30%)</b>
<b>Geomorphic Position</b>	Steep to very steep, dissected, lower mountain sideslopes.	Similar position as Shadeleaf family.
<b>Typical Vegetation Series</b>	Jeffrey Pine Mixed Conifer Forest	Jeffrey Pine Mixed Conifer Forest, Jeffrey Pine - Incense Cedar Woodland

**Soil Profile Description**

<b>Surface Soil</b>	0-4" dark grayish brown gravelly and very gravelly clay loam, moderate and strong fine granular and subangular blocky structure, 25-40% gravel, neutral to mildly alkaline.	0-6" very dark gravelly clay loam moderate fine granular to strong coarse subangular blocky structure, 10 to 25% gravel and cobbles, neutral to mildly alkaline.
<b>Subsoil</b>	4-23" brown very gravelly clay and pale brown gravelly clay, strong medium to weak coarse subangular blocky structure, 20-47% gravel, mildly alkaline.	6-19" very dark gray gravelly clay and olive brown very gravelly clay, strong coarse and medium subangular blocky structure, 35 to 50% gravel and cobbles, mildly alkaline.
<b>Substratum</b>	23-33" highly fractured and weathered ultramafic rock.	19-28" olive brown extremely cobbly clay, relict rock structure, 70% gravel and cobbles, mildly alkaline. 28-30" fractured, weathered serpentized peridotite.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	5-6	5-7
<b>Adapted Species Group</b>	JP, IC, DF	JP, IC, DF
<b>Soil Erodibility</b>	Low	Moderate
<b>AWC for Profile Depth</b>	2.8-4.0	1.6-3.8
<b>AWC for Surface 24"</b>	2.7-3.1	2.3-2.9
<b>Seedling Survival Potential</b>	Moderate	Moderate
<b>Plantability Potential</b>	High-Moderate	High-Low
<b>Hydrologic Soil Group</b>	C	C-D
<b>Potential for Roadbed Damage</b>	High	Moderate
<b>Inclusions (20%)</b>	Dubakella family Dewmine family Rock outcrop	
<b>Remarks:</b>	Shadeleaf limitations: Ca/Mg imbalance limits species and productivity. Kang limitations: Ca/Mg imbalance, possible toxicity and poor aeration.	

**290 Shasta family, 0 to 15 percent slopes**

Map Unit Components	<b>Shasta family (75%)</b>
Geomorphic Position	Gently sloping mudflows.
Typical Vegetation Series	Mixed Conifer Fir Forest White Fir Forest

**Soil Profile Description**

Surface Soil	0-22" very dark grayish brown coarse sandy loam to dark grayish brown loamy sand, moderate very fine granular structure, 7-11% gravel, strongly acid.
Subsoil	
Substratum	22-70" grayish brown cobbly loamy sand to gray very cobbly coarse sand, very weak medium subangular blocky structure to massive 29-35% gravel and cobbles, medium to strongly acid.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	3
Adapted Species Group	PP
Soil Erodibility	Moderate
AWC for Profile Depth	3.6-4.9
AWC for Surface 24"	1.3-2.2
Seedling Survival Potential	Low-Moderate
Plantability Potential	High
Hydrologic Soil Group	A
Potential for Roadbed Damage	High
Inclusions (25%)	Sadie family, deep Washougal family, deep
Remarks:	Includes some phases which are seasonally flooded, subsoil commonly has very gravelly strata.

**291 Shasta-Germany, deep families complex, 0 to 20 percent slopes**

Map Unit Components	<b>Shasta family (60%)</b>	<b>Germany family, deep (30%)</b>
Geomorphic Position	Gently sloping mudflows.	Gently sloping mudflows and lava flows.
Typical Vegetation Series	Ponderosa Pine Forest, Upper Montane Mixed Chaparral	Ponderosa Pine Forest, Upper Montane Mixed Chaparral

**Soil Profile Description**

Surface Soil	0-22" very dark grayish brown coarse sandy loam to dark grayish brown loamy sand, moderate very fine granular structure, 7-11% gravel, strongly acid.	0-6" very dark brown sandy loam weak medium subangular blocky structure 5% gravel, slightly acid.
Subsoil		6-31" dark brown fine sandy loam, and yellowish brown gravelly fine sandy loam, weak medium and fine subangular blocky structure, 10-15% gravel, slightly acid.
Substratum	22-70" grayish brown cobbly loamy sand to gray very cobbly coarse sand, very weak medium subangular blocky structure to massive 29-35% gravel and cobbles, medium to strongly acid.	31-60" light yellowish brown gravelly sandy loam and brown very gravelly very fine sandy loam, massive, 30-40% gravel, neutral.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	3	3
Adapted Species Group	PP	PP, WF, JP, SP
Soil Erodibility	Moderate	Moderate
AWC for Profile Depth	3.6-4.9	5.0-6.3
AWC for Surface 24"	1.3-2.2	2.7-3.6
Seedling Survival Potential	Low-Moderate	Moderate-High
Plantability Potential	High	High
Hydrologic Soil Group	A	B
Potential for Roadbed Damage	High	High
Inclusions (10%)	Sadie family, deep Washougal family, deep	

**Remarks:** A topographic sequence, Shasta family is less developed and occupies low outwash terraces, Germany family deep is developed in older deposits on higher terraces.

**292 Shasta-Washougal families-Washougal family, deep association, 0 to 30 percent slopes**

<b>Map Unit Components</b>	<b>Shasta family (40%)</b>	<b>Washougal family (30%)</b>	<b>Washougal family, deep (20%)</b>
<b>Geomorphic Position</b>	Gently sloping mudflows.	Lava flows and elevated areas not inundated by outwash.	Outwash channels and terraces.
<b>Typical Vegetation Series</b>	Mixed Conifer - Fir Forest Ponderosa Pine Forest	Mixed Conifer - Fir Forest Ponderosa Pine Forest	Mixed Conifer - Fir Forest Ponderosa Pine Forest

**Soil Profile Description**

<b>Surface Soil</b>	0-22" very dark grayish brown coarse sandy loam to dark grayish brown loamy sand, moderate very fine granular structure, 7-11% gravel, strongly acid.	0-10" dark brown gravelly loam and very cobbly fine sandy loam, weak fine subangular blocky structure, 15 to 65% cobbles and gravel, neutral to slightly acid.	0-26" dark brown sandy loam to brown extremely cobbly sandy loam, single grain, 10-65% gravel and cobbles, slightly acid to neutral.
<b>Subsoil</b>		10-30" brown extremely cobbly fine sandy loam, weak very fine subangular blocky structure, 70% cobbles and gravel, neutral.	26-36" yellowish brown extremely cobbly cobbly coarse sandy loam, single grain, 75% gravel and cobbles, neutral.
<b>Substratum</b>	22-70" grayish brown cobbly loamy sand to gray very cobbly coarse sand, very weak medium subangular blocky structure to massive 29-35% gravel and cobbles, medium to strongly acid.	30-32" fractured basalt.	36-60" gray and light gray extremely cobbly, loamy coarse sand, single grain, slightly acid to neutral.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	3	5	4
<b>Adapted Species Group</b>	PP	PP	PP, WF, JP, SP
<b>Soil Erodibility</b>	Moderate	Moderate	Moderate
<b>AWC for Profile Depth</b>	3.6-4.9	1.6-3.4	4.4-6.3
<b>AWC for Surface 24"</b>	1.3-2.2	1.4-2.3	1.4-2.3
<b>Seedling Survival Potential</b>	Low-Moderate	Low-Moderate	Low-Moderate
<b>Plantability Potential</b>	High	V.Low-Low	Low-V. Low
<b>Hydrologic Soil Group</b>	A	B	C
<b>Potential for Roadbed Damage</b>	High	Low	Low

**Inclusions (10%)**

Germany family  
Germany family, deep

**Remarks:**

A topo sequence association, Washougal family, deep occupies outwash channels and low terraces, Shasta family occupies high terraces and Washougal family, moderately deep occupies lava flows not covered by outwash deposits.

## 293 Sheld family, 0 to 25 percent slopes

Map Unit Components	<b>Sheld family (80%)</b>
Geomorphic Position	Gently sloping lava flows.
Typical Vegetation Series	Red Fir - White Fir Forest, Sierran-Cascade Mixed Conifer Forest, Upper Montane Mixed Chaparral

### Soil Profile Description

Surface Soil	0-11" dark brown gravelly coarse sandy loam to brown gravelly sandy loam, single grain, 25% gravel and cobbles, slightly acid.
Subsoil	11-42" dark yellowish brown and brown extremely cobbly fine sandy loam, weak to strong medium subangular blocky structure, 75% cobbles, stones and gravel, slightly acid.
Substratum	42-44" consolidated glacial till.

### Soil Properties & Management Interpretations

Forest Survey Site Class	5
Adapted Species Group	WF, RF, JP, WWP
Soil Erodibility	Low
AWC for Profile Depth	1.5-3.2
AWC for Surface 24"	1.0-2.2
Seedling Survival Potential	Low-Moderate
Plantability Potential	V. Low-Low
Hydrologic Soil Group	B
Potential for Roadbed Damage	Low
Inclusions (20%)	Yallani family Rock outcrop, volcanic Washougal family, deep
Remarks:	Plantability of Sheld family depends on depth of ashy overburden and method of site preparation, frequent bouldery inclusions create moderate limitations for site preparation equipment.

**294 Sheld family, 20 to 40 percent slopes**

Map Unit Components	<b>Sheld family (75%)</b>
Geomorphic Position	Moderately steep volcanic sideslopes.
Typical Vegetation Series	Upper Montane Mixed Chaparral

**Soil Profile Description**

Surface Soil	0-11" dark brown gravelly coarse sandy loam to brown gravelly sandy loam, single grain, 25% gravel and cobbles, slightly acid.
Subsoil	11-42" dark yellowish brown and brown extremely cobbly fine sandy loam, weak to strong medium subangular blocky structure, 75% cobbles, stones and gravel, slightly acid.
Substratum	42-44" consolidated glacial till.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	5
Adapted Species Group	WF, RF, JP, WWP
Soil Erodibility	Low
AWC for Profile Depth	1.5-3.2
AWC for Surface 24"	1.0-2.2
Seedling Survival Potential	Low-Moderate
Plantability Potential	V. Low-Low
Hydrologic Soil Group	B
Potential for Roadbed Damage	Low
Inclusions (25%)	Rock outcrop, volcanic Revit family Washougal family, deep Yallani family
Remarks:	Plantability of Sheld family depends on depth of ashy overburden and method of site preparation, frequent bouldery inclusions create moderate limitations for site preparation equipment.

**295 Sheld family, 40 to 60 percent slopes**

Map Unit Components	<b>Sheld family (75%)</b>
Geomorphic Position	Steep mountain sideslopes on volcanic uplands.
Typical Vegetation Series	Snowbrush Chaparral Red Fir-White Fir Forest, Mixed - Upper Montane Coniferous Forest

**Soil Profile Description**

Surface Soil	0-11" dark brown gravelly coarse sandy loam to brown gravelly sandy loam, single grain, 25% gravel and cobbles, slightly acid.
Subsoil	11-42" dark yellowish brown and brown extremely cobbly fine sandy loam, weak to strong medium subangular blocky structure, 75% cobbles, stones and gravel, slightly acid.
Substratum	42-44" consolidated glacial till.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	5
Adapted Species Group	WF, RF, JP, WWP
Soil Erodibility	Low
AWC for Profile Depth	1.5-3.2
AWC for Surface 24"	1.0-2.2
Seedling Survival Potential	Low-Moderate
Plantability Potential	V. Low
Hydrologic Soil Group	B
Potential for Roadbed Damage	Low
Inclusions (25%)	Yallani family Rock outcrop, volcanic
Remarks:	Usually very bouldery with severe limitations for brush clearing or site preparation equipment.

**296 Sheld-Revit families complex, 20 to 50 percent**

Map Unit Components	<b>Sheld family (60%)</b>	<b>Revit family (30%)</b>
Geomorphic Position	Moderately steep mountain sideslopes.	Moderately steep mountain sideslopes.
Typical Vegetation Series	Snowbrush Chaparral Red Fir-White Fir Forest, Mixed - Upper Montane Coniferous Forest	Snowbrush Chaparral Red Fir-White Fir Forest, Mixed - Upper Montane Coniferous Forest

**Soil Profile Description**

Surface Soil	0-11" dark brown gravelly coarse sandy loam to brown gravelly sandy loam, single grain, 25% gravel and cobbles, slightly acid.	0-12" very dark grayish brown loamy sand to dark grayish weak fine granular to weak medium subangular blocky structure, 0-14% gravel, strongly to medium acid.
Subsoil	11-42" dark yellowish brown and brown extremely cobbly fine sandy loam, weak to strong medium subangular blocky structure, 75% cobbles, stones and gravel, slightly acid.	12-36" brown cobbly loamy fine sand, weak medium subangular blocky structure, 30-35% gravel, medium to strongly acid.
Substratum	42-44" consolidated glacial till.	36-40" fractured vesicular basalt.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	5	4
Adapted Species Group	WF, RF, JP, WWP	WF, RF, JP
Soil Erodibility	Low	Low
AWC for Profile Depth	1.5-3.2	3.2-5.2
AWC for Surface 24"	1.0-2.2	2.4-2.8
Seedling Survival Potential	Low-Moderate	Moderate
Plantability Potential	V. Low-Low	High
Hydrologic Soil Group	B	B
Potential for Roadbed Damage	Low	High
Inclusions (10%)	Rock outcrop, volcanic	
Remarks:	Unit has frequent very bouldery inclusions with severe site preparation equipment limitations.	

**297 Sheld-Revit families-Glacial outwash association, 10 to 35 percent slopes**

Map Unit Components	Sheld family (40%)	Revit family (30%)	Rubble land (30%)
Geomorphic Position	Drainages, outwash channels.	Outwash flats, gently sloping sideslopes.	Channels, moraines, drainages.
Typical Vegetation Series	Snowbrush Chaparral Red Fir-White Fir Forest	Red Fir-White Fir Forest	Exposure Chaparral Scree Shrub

**Soil Profile Description**

Surface Soil	0-11" dark brown gravelly coarse sandy loam to brown gravelly sandy loam, single grain, 25% gravel and cobbles, slightly acid.	0-12" very dark grayish brown loamy sand to dark grayish weak fine granular to weak medium subangular blocky structure, 0-14% gravel, strongly to medium acid.
Subsoil	11-42" dark yellowish brown and brown extremely cobbly fine sandy loam, weak to strong medium subangular blocky structure, 75% cobbles, stones and gravel, slightly acid.	12-36" brown cobbly loamy fine sand, weak medium subangular blocky structure, 30-35% gravel, medium to strongly acid.
Substratum	42-44" consolidated glacial till.	36-40" fractured vesicular basalt.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	5	4	
Adapted Species Group	WF, RF, JP, WWP	WF, RF, JP	
Soil Erodibility	Low	Low	
AWC for Profile Depth	1.5-3.2	3.2-5.2	
AWC for Surface 24"	1.0-2.2	2.4-2.8	
Seedling Survival Potential	Low-Moderate	Moderate	
Plantability Potential	V. Low-Low	High	
Hydrologic Soil Group	B	B	D
Potential for Roadbed Damage	Low	High	Low

Inclusions (10%)  
 Rock outcrop, volcanic  
 Typic Cryandepts  
 Washougal family, deep  
 Scoria deposits

Remarks: Complex landforms with very steep drainages, moraines and outwash flats, severe site preparation equipment limitations.

**298 Sheld family-Rock outcrop association, 15 to 50 percent slopes**

<b>Map Unit Components</b>	<b>Sheld family (60%)</b>	<b>Revit family (30%)</b>
<b>Geomorphic Position</b>	Dissected lava flows.	Recent lava flows, lava ridge tops.
<b>Typical Vegetation Series</b>	Red Fir-White Fir Forest Ponderosa Pine Forest Upper Montane Mixed Chaparral	Mt. Mahogany Chaparral

**Soil Profile Description**

<b>Surface Soil</b>	0-11" dark brown gravelly coarse sandy loam to brown gravelly sandy loam, single grain, 25% gravel and cobbles, slightly acid.
<b>Subsoil</b>	11-42" dark yellowish brown and brown extremely cobbly fine sandy loam, weak to strong medium subangular blocky structure, 75% cobbles, stones and gravel, slightly acid.
<b>Substratum</b>	42-44" consolidated glacial till.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	5
<b>Adapted Species Group</b>	WF, RF, JP, WWP
<b>Soil Erodibility</b>	Low
<b>AWC for Profile Depth</b>	1.5-3.2
<b>AWC for Surface 24"</b>	1.0-2.2
<b>Seedling Survival Potential</b>	Low-Moderate
<b>Plantability Potential</b>	V. Low-Low
<b>Hydrologic Soil Group</b>	B D
<b>Potential for Roadbed Damage</b>	Low Low
<b>Inclusions (10%)</b>	Yallani family
<b>Remarks:</b>	Includes very bouldery soils with severe site preparation equipment limitations.

**299 Skymor family, 40 to 80 percent slopes**

Map Unit Components	<b>Skymor family (75%)</b>
Geomorphic Position	Moderately steep to very steep, linear, upper slopes and ridge tops.
Typical Vegetation Series	Chaparral

**Soil Profile Description**

Surface Soil	0-3" brown extremely cobbly sandy loam, single grain 65% gravel, cobbles and stones, slightly acid.
Subsoil	3-17" yellowish brown extremely stony sandy loam and very pale brown extremely cobbly loam, weak fine and moderate medium subangular blocky structure, 65% gravel, cobbles and stones, medium and strongly acid.
Substratum	17-19" fractured basic igneous rock.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	6-7
Adapted Species Group	BL, WF, JP, SP
Soil Erodibility	Low
AWC for Profile Depth	0.9-2.0
AWC for Surface 24"	0.9-1.7
Seedling Survival Potential	V. Low-Low
Plantability Potential	V. Low
Hydrologic Soil Group	C-D
Potential for Roadbed Damage	Low
Inclusions (25%)	Jayar family Rock outcrop, basic intrusive

**Remarks:** In some areas this soil is mapped over cemented glacial till and may have rubble overburden.

**300 Skymor-Jayar families complex, 20 to 60 percent slopes**

<b>Map Unit Components</b>	<b>Skymor family (60%)</b>	<b>Jayar family (30%)</b>
<b>Geomorphic Position</b>	Moderately steep to steep, linear mountain sideslopes.	Similar position as Skymor family.
<b>Typical Vegetation Series</b>	Huckleberry Oak Chaparral, Upper Montane Mixed Chaparral	White Fir Forest Red Fir - White Fir Forest

**Soil Profile Description**

<b>Surface Soil</b>	0-3" brown extremely cobbly sandy loam, single grain 65% gravel, cobbles and stones, slightly acid.	0-5" light gray very gravelly sandy loam, moderate medium granular structure, 40% gravel and cobbles, medium acid.
<b>Subsoil</b>	3-17" yellowish brown extremely stony sandy loam and very pale brown extremely cobbly loam, weak fine and moderate medium subangular blocky structure, 65% gravel, cobbles and stones, medium and strongly acid.	5-26" light brownish gray very cobbly very fine sandy loam and light gray very cobbly loam, weak medium subangular blocky structure, 42-55% cobbles and gravel, strongly to slightly acid.
<b>Substratum</b>	17-19" fractured basic igneous rock.	26-36" moderately fractured unweathered basic intrusive rock.

**Soil Properties & Management Interpretations**

<b>Forest Survey Site Class</b>	6-7	5-6
<b>Adapted Species Group</b>	BL, WF, JP, SP	WF, JP, SP, DF
<b>Soil Erodibility</b>	Low	Low
<b>AWC for Profile Depth</b>	0.9-2.0	2.0-4.0
<b>AWC for Surface 24"</b>	0.9-1.7	2.0-3.2
<b>Seedling Survival Potential</b>	V. Low-Low	Moderate
<b>Plantability Potential</b>	High-Low	High-Low
<b>Hydrologic Soil Group</b>	C-D	B
<b>Potential for Roadbed Damage</b>	Low	Moderate
<b>Inclusions (10%)</b>	Rock outcrop, ultramafic	
<b>Remarks:</b>	Some units have rubble overburden.	

**301 Skymor-Jayar, deep, families complex, 20 to 40 percent slopes**

Map Unit Components	<b>Skymor family (60%)</b>	<b>Jayar family, deep (30%)</b>
Geomorphic Position	Moderately steep mountain sideslopes.	Moderately steep mountain sideslopes.
Typical Vegetation Series	Upper Montane Mixed Chaparral Lodgepole Pine Forest	Lodgepole Pine Forest, Upper Montane Mixed Chaparral

**Soil Profile Description**

Surface Soil	0-3" brown extremely cobbly sandy loam, single grain 65% gravel, cobbles and stones, slightly acid.	0-4" yellowish brown very gravelly sandy loam, strong fine and very fine granular structure, 40% gravel and cobbles, strongly acid.
Subsoil	3-17" yellowish brown extremely stony sandy loam and very pale brown extremely cobbly loam, weak fine and moderate medium subangular blocky structure, 65% gravel, cobbles and stones, medium and strongly acid.	4-20" yellowish brown very gravelly sandy loam, weak fine subangular blocky structure, 45 to 50% gravel and cobbles, medium acid.
Substratum	17-19" fractured basic igneous rock.	20-48" pale yellow extremely stony coarse sandy loam and light yellowish brown extremely stony loamy sand, single grain, 62-75% gravel and stones, slightly acid. 48-50" hard, compacted glacial till.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	6-7	4-5
Adapted Species Group	BL, WF, JP, SP	WF, JP, SP, DF
Soil Erodibility	Low	Low
AWC for Profile Depth	0.9-2.0	2.6-4.0
AWC for Surface 24"	0.9-1.7	1.2-2.0
Seedling Survival Potential	V. Low-Low	Low-Moderate
Plantability Potential	High-Low	High-Moderate
Hydrologic Soil Group	C-D	A-B
Potential for Roadbed Damage	Low	Moderate

Inclusions (10%)  
 Rubble land  
 Typic Cryaquolls  
 Soils similar to Skymor but with dark surface horizons

Remarks:

**302 Skymor family-Rock outcrop complex, 20 to 40 percent slopes**

Map Unit Components	<b>Skymor family (55%)</b>	<b>Rock outcrop (20%)</b>
Geomorphic Position	Moderately steep, dissected, linear ridge tops and upper mountain sideslopes.	Similar topography as Skymor family.
Typical Vegetation Series	Upper Montane Mixed Chaparral Very Open Mixed Upper Montane Coniferous Forest	Rock rubble Scree/Shrub

**Soil Profile Description**

Surface Soil	0-3" brown extremely cobbly sandy loam, single grain 65% gravel, cobbles and stones, slightly acid.	
Subsoil	3-17" yellowish brown extremely stony sandy loam and very pale brown extremely cobbly loam, weak fine and moderate medium subangular blocky structure, 65% gravel, cobbles and stones, medium and strongly acid.	
Substratum	17-19" fractured basic igneous rock.	Basic intrusive rock outcrop.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	6-7	
Adapted Species Group	BL, WF, JP, SP	
Soil Erodibility	Low	
AWC for Profile Depth	0.9-2.0	
AWC for Surface 24"	0.9-1.7	
Seedling Survival Potential	V. Low-Low	
Plantability Potential	High-Low	
Hydrologic Soil Group	C-D	D
Potential for Roadbed Damage	Low	Low
Inclusions (25%)	Jayar family Lithic Xerumbrepts	

Remarks:

### 303 Skymor family-Rock outcrop association, 40 to 80 percent slopes

Map Unit Components	<b>Skymor family (60%)</b>	<b>Rock outcrop (30%)</b>
Geomorphic Position	Steep to very linear, upper mountain sideslopes and ridge tops.	Steep ridges and upper slopes
Typical Vegetation Series	Upper Montane Mixed Chaparral	Scree/Shrub

#### Soil Profile Description

Surface Soil	0-3" brown extremely cobbly sandy loam, single grain 65% gravel, cobbles and stones, slightly acid.
Subsoil	3-17" yellowish brown extremely stony sandy loam and very pale brown extremely cobbly loam, weak fine and moderate medium subangular blocky structure, 65% gravel, cobbles and stones, medium and strongly acid.
Substratum	17-19" fractured basic igneous rock.

#### Soil Properties & Management Interpretations

Forest Survey Site Class	6-7	
Adapted Species Group	BL, WF, JP, SP	
Soil Erodibility	Low	
AWC for Profile Depth	0.9-2.0	
AWC for Surface 24"	0.9-1.7	
Seedling Survival Potential	V. Low-Low	
Plantability Potential	Low	
Hydrologic Soil Group	C-D	D
Potential for Roadbed Damage	Low	Low
Inclusions (25%)	Soils similar to Skymor family lacking B horizons Jayar family	
Remarks:	Also occurs as a complex.	

**304 Soulajule family, 20 to 40 percent slopes**

Map Unit Components	<b>Soulajule family (75%)</b>
Geomorphic Position	Elevated terraces, gently sloping broad ridgetops.
Typical Vegetation Series	Gray Oak Woodland Digger Pine Woodland

**Soil Profile Description**

Surface Soil	0-8" strong brown loam and gravelly loam, strong fine granular and subangular, blocky structure, 10-20% gravel, neutral.
Subsoil	8-31" yellowish red and strong brown very gravelly clay loam to yellowish red very cobbly clay, moderate medium subangular blocky structure, 18-40% gravel and cobbles, slightly acid.
Substratum	31-40" consolidated nonmarine sediment (paralithic contact).

**Soil Properties & Management Interpretations**

Forest Survey Site Class	6
Adapted Species Group	BL, WF, JP, SP
Soil Erodibility	Moderate
AWC for Profile Depth	2.5-4.5
AWC for Surface 24"	2.1-3.3
Seedling Survival Potential	Low
Plantability Potential	High
Hydrologic Soil Group	C
Potential for Roadbed Damage	High
Inclusions (25%)	Marpa family Forbes family

Remarks:

**305 Soulajule family, 40 to 60 percent slopes**

Map Unit Components	<b>Soulajule family (75%)</b>
Geomorphic Position	Elevated terraces, steep mountain sideslopes.
Typical Vegetation Series	Gray Oak Woodland Digger Pine Woodland

**Soil Profile Description**

Surface Soil	0-8" strong brown loam and gravelly loam, strong fine granular and subangular, blocky structure, 10-20% gravel, neutral.
Subsoil	8-31" yellowish red and strong brown very gravelly clay loam to yellowish red very cobbly clay, moderate medium subangular blocky structure, 18-40% gravel and cobbles, slightly acid.
Substratum	31-40" consolidated nonmarine sediment (paralithic contact).

**Soil Properties & Management Interpretations**

Forest Survey Site Class	6
Adapted Species Group	BL, WF, JP, SP
Soil Erodibility	Moderate
AWC for Profile Depth	2.5-4.5
AWC for Surface 24"	2.1-3.3
Seedling Survival Potential	Low
Plantability Potential	Moderate
Hydrologic Soil Group	C
Potential for Roadbed Damage	High
Inclusions (25%)	Marpa family Holland family, deep Forbes family

Remarks:

**306 Stecum family-Rock outcrop-Entic Cryumbrepts complex, 50 to 80 percent slopes**

Map Unit Components	<b>Stecum family (40%)</b>	<b>Rock outcrop and/or rubble land (40%)</b>	<b>Entic Cryumbrepts (20%)</b>
Geomorphic Position	Steep to very steep, linear upper slopes, ridges, and cirque rims.	Similar position as Stecum family - dominates ridge top.	Similar position as Stecum family.
Typical Vegetation Series	Red Fir - White Fir Forest, Red Fir Forest, Red Fir Subalpine Woodland	Chaparral	Upper Montane Dry Meadows

**Soil Profile Description**

Surface Soil	0-5" light olive brown very stony loamy sand, weak fine granular structure, 55% stones and gravel, slightly acid.	0-17" dark yellowish brown gravelly very fine sandy lom, weak very fine granular and subangular blocky structure, 15-20% gravel, slightly acid.
Subsoil		17-25" yellowish brown gravelly very fine sandy loam, weak coarse subangular blocky structure, 25% gravel, strongly acid.
Substratum	5-31" light olive brown extremely stony loamy sand and olive yellow very stony loamy sand, weak fine and medium subangular blocky structure to massive, 50-70% stones and gravel, slightly acid. 31-34" compacted glacial till.	25-28" fractured basic metasedimentary rock.

**Soil Properties & Management Interpretations**

Forest Survey Site Class	6-7	5-7
Adapted Species Group	BL, RF, JP, WWP	WF,RF,JP,BL
Soil Erodibility	Low	Low
AWC for Profile Depth	1.0-1.8	3.7-6.0
AWC for Surface 24"	0.7-1.8	3.2-3.6
Seedling Survival Potential	V. Low-Low	High
Plantability Potential	High-Low	High-Moderate
Hydrologic Soil Group	A	D
Potential for Roadbed Damage	Moderate	Low
Inclusions (10%)	Lithic Cryumbrepts Tallac family	B
Remarks:	Stecum limitation: Short growing season and extreme cold. Entic Cryumbrepts limitation: Unknown nutrients or moisture limits establishment and growth.	