

HAE Haypress-Toiyabe complex, 2 to 30 percent slopes

Elevation: 5,000 to 5,400 feet Annual Precipitation: 20 to 25 inches

Typical Vegetation Mixed conifer series.

Soil Map Unit Components	Haypress	Toiyabe
Proportion (percent)	45	45

Soil Profile Description

Surface Layer	0 to 14 inches; grayish brown loamy coarse sand; weak platy structure; medium acid.	0 to 8 inches; grayish brown gravelly loamy coarse sand; single grained; slightly acid.
Subsoil	14 to 49 inches; pale brown loamy coarse sand; massive; medium acid.	8 to 16 inches; pale brown cobbly loamy coarse sand; single grained; strongly acid.
Substratum	49 inches; weathered granitic rock.	16 inches; highly weathered granitic rock.

Soil Properties & Management Interpretations

Effective Rooting Depth (inches)	40 to 60	10 to 20
Available Water Capacity Class	Very low to low	Very low
AWC for top 20"	1.2-1.6	0.8-1.0
Permeability: Subsoil Substratum	Rapid Slow	Rapid Moderate
Drainage Class	Somewhat excessively drained	Somewhat excessively drained
Max Erosion Hazard	High	High
Seedling Mortality	Severe to moderate	Severe
Revegetating Exposed Subsoil	Slight	Severe
Soil Productivity		
Forest Survey Site Class	5 P, WF	Not rated
Annual Forage (lbs/acre)	60 to 120	60 to 120
Soil Manageability		
Group	II	II
Class	2ep	3eD
Inclusions	Included in this unit are small areas of Rock outcrop; in the Roberts Canyon area soils similar to Haypress but with an ochric epipedon; and moderately deep soils with or without a clay increase in the subsoil. Included areas make up about 10 percent of the total area.	
Management Considerations	Sandy soils and relatively low cation exchange capacity (CEC). Toiyabe soils have a thin surface layer.	

HAG Haypress-Toiyabe complex, 30 to 75 percent slopes

Elevation: 5,200 to 5,400 feet Annual Precipitation: 20 to 25 inches

Typical Vegetation

Mixed conifer series.

Soil Map Unit
Components

Haypress

Toiyabe

Proportion (percent)

45

40

Soil Profile Description

Surface Layer

0 to 14 inches; grayish brown loamy coarse sand; weak platy structure; medium acid.

0 to 8 inches; grayish brown gravelly loamy coarse sand; single grained; slightly acid.

Subsoil

14 to 49 inches; pale brown loamy coarse sand; massive; medium acid.

8 to 16 inches; pale brown cobbly loamy coarse sand; single grained; strongly acid.

Substratum

49 inches; weathered granitic rock.

16 inches; highly weathered granitic rock.

Soil Properties & Management Interpretations

Effective Rooting
Depth (inches)

40 to 60

10 to 20

Available Water
Capacity Class

Very low to low

Very low

AWC for top 20"

1.2-1.6

0.8-1.0

Permeability: Subsoil
Substratum

Rapid
Slow

Rapid
Moderate

Drainage Class

Somewhat excessively drained

Somewhat excessively drained

Max Erosion Hazard

High

Very high

Seedling Mortality

Severe to moderate

Severe

Revegetating Exposed
Subsoil

Slight

Severe

Soil Productivity

Forest Survey Site Class
Annual Forage (lbs/acre)

5 P, WF
60 to 120

Not capable
60 to 120

Soil Manageability
Group
Class

III
3Ep

III
4ED

Inclusions

Included in this unit are small areas of Rock outcrop; in the Roberts Canyon area soils similar to Haypress but with an ochric epipedon; and moderately deep soils with or without a clay increase in the subsoil. Included areas make up about 15 percent of the total area.

Management
Considerations

Steep and very steep slopes. Sandy soils and relatively low cation exchange capacity (CEC). Toiyabe soils have a thin surface layer.

✓HAG2 Haypress-Toiyabe-Rock outcrop complex, 30 to 75 percent slopes, eroded

Elevation: 5,200 to 5,400 feet Annual Precipitation: 20 to 25 inches

Typical Vegetation Ceanothus-Mixed conifer series; Mixed conifer-Ceanothus series.

Soil Map Unit Components	Haypress, eroded	Toiyabe, eroded	Rock outcrop
Proportion (percent)	35	35	20

Soil Profile Description

Soil Profile Description	Haypress, eroded	Toiyabe, eroded	Rock outcrop
Surface Layer	0 to 12 inches; grayish brown loamy sand; massive; slightly acid.	0 to 6 inches; brown loamy coarse sand; massive; slightly acid.	Granitic rock.
Subsoil	12 to 48 inches; light gray loamy sand; massive; medium acid.	6 to 12 inches; pale brown loamy coarse sand; single grain structure; medium acid.	
Substratum	48 inches; weathered granitic rock.	12 inches; weathered granitic rock.	

Soil Properties & Management Interpretations

Soil Properties & Management Interpretations	Haypress, eroded	Toiyabe, eroded
Effective Rooting Depth (inches)	40 to 60	10 to 20
Available Water Capacity Class	Very low	Very low
AWC for top 20"	1.2-1.6	0.7-1.0
Permeability: Subsoil	Rapid	Rapid
Substratum	Slow	Moderate
Drainage Class	Somewhat excessively drained	Somewhat excessively drained
Max Erosion Hazard	High	Very high
Seedling Mortality	Severe	Severe
Revegetating Exposed Subsoil	Slight	Severe
Soil Productivity		
Forest Survey Site Class	Not rated	Not rated
Annual Forage (lbs/acre)	Not rated	Not rated
Soil Manageability		
Group	IV	IV
Class	4Ep	4ED

Inclusions Included in this unit are small areas of soil similar to Haypress with thin, light colored surface layer, and moderately deep soils. Included areas make up about 10 percent of the total area.

Management Considerations Steep and very steep slopes. Surface soils have been eroded. On-site investigations are necessary to determine if corrective treatments are needed. Sandy soils and relatively low cation exchange capacity (CEC). Toiyabe soils have a thin surface layer. Rock outcrop areas are a potential source of aggregate. Concentrated surface runoff from Rock outcrop areas can increase erosion on adjacent soils.

HBE Haypress-Toiyabe-Cryumbrepts, wet complex, 2 to 30 percent slopes

Elevation: 5,000 to 5,400 feet Annual Precipitation: 20 to 25 inches

Typical Vegetation Mixed conifer series; Jeffrey/Ponderosa series.

Soil Map Unit Components	Haypress	Toiyabe	Cryumbrepts, wet
Proportion (percent)	35	35	15

Soil Profile Description

	Haypress	Toiyabe	Cryumbrepts, wet
Surface Layer	0 to 14 inches; grayish brown loamy coarse sand; weak platy structure; medium acid.	0 to 8 inches; grayish brown gravelly loamy coarse sand; single grained; slightly acid.	Thick and dark colored; stratified sandy loam, silt loam, and clay loam; gravelly, cobbly, or stony.
Subsoil	14 to 49 inches; pale brown loamy coarse sand; massive; medium acid.	8 to 16 inches; pale brown cobbly loamy coarse sand; single grained; strongly acid.	
Substratum	49 inches; weathered granitic rock.	16 inches; highly weathered granitic rock.	Stratified loam to clay loam with dark colored mottles; gravelly, cobbly, or stony.

Soil Properties & Management Interpretations

Effective Rooting Depth (inches)	40 to 60	10 to 20	Variable
Available Water Capacity Class	Very low to low	Very low	Very low
AWC for top 20"	1.2-1.6	0.8-1.0	
Permeability: Subsoil	Rapid	Rapid	Moderately rapid
Substratum	Slow	Moderate	Very slow
Drainage Class	Somewhat excessively drained	Somewhat excessively drained	Poorly drained
Max Erosion Hazard	High	High	Very high
Seedling Mortality	Severe to moderate	Severe	Severe
Revegetating Exposed Subsoil	Slight	Severe	Severe
Soil Productivity			
Forest Survey Site Class	5,6 P, WF	Not rated	Not capable
Annual Forage (lbs/acre)	60 to 120	60 to 120	170 to 640
Soil Manageability			
Group	II	II	II
Class	2ep	3eD	4EW

Inclusions Included in this unit are small areas of Rock outcrop; soils similar to Haypress with a thin, light colored surface layer; and moderately deep soils. Included areas make up about 15 percent of the total area.

Management Considerations Sandy soils and relatively low cation exchange capacity. Toiyabe soils have a thin surface layer. Cryumbrepts, wet have a high water table most of the year, are susceptible to puddling, and often have impermeable layers between 1 and 2 feet.

HBG Haypress-Toiyabe-Cryumbrepts, wet complex, 30 to 75 percent slopes

Elevation: 5,000 to 5,400 feet Annual Precipitation: 20 to 25 inches

Typical Vegetation

Mixed conifer series; Jeffrey/Ponderosa series.

Soil Map Unit Components

Haypress

Toiyabe

Cryumbrepts, wet

Proportion (percent)

35

35

15

Soil Profile Description

Surface Layer

0 to 14 inches; grayish brown loamy coarse sand; weak platy structure; medium acid.

0 to 8 inches; grayish brown gravelly loamy coarse sand; single grained; slightly acid.

Thick and dark colored; stratified sandy loam, silt loam, and clay loam; gravelly, cobbly, or stony.

Subsoil

14 to 49 inches; pale brown loamy coarse sand; massive; medium acid.

8 to 16 inches; pale brown cobbly loamy coarse sand; single grained; strongly acid.

Substratum

49 inches; weathered granitic rock.

16 inches; highly weathered granitic rock.

Stratified loam to clay loam with dark colored mottles; gravelly, cobbly, or stony.

Soil Properties & Management Interpretations

Effective Rooting Depth (inches)

40 to 60

10 to 20

Variable

Available Water Capacity Class

Very low to low

Very low

Very low

AWC for top 20"

1.2-1.6

0.8-1.0

Permeability: Subsoil
Substratum

Rapid
Slow

Rapid
Moderate

Moderately rapid
Very slow

Drainage Class

Somewhat excessively drained

Somewhat excessively drained

Poorly drained

Max Erosion Hazard

High

Very high

Very high

Seedling Mortality

Severe to moderate

Severe

Severe

Revegetating Exposed Subsoil

Slight

Severe

Severe

Soil Productivity

Forest Survey Site Class
Annual Forage (lbs/acre)

5,6 P, WF
60 to 120

Not rated
60 to 120

Not capable
170 to 640

Soil Manageability

Group
Class

IV
4Ep

IV
4ED

IV
4EW

Inclusions

Included in this unit are small areas of Rock outcrop; soils similar to Haypress with a thin, light colored surface layer; and moderately deep soils. Included areas make up about 15 percent of the total area.

Management Considerations

Steep and very steep slopes. Sandy soils and relatively low cation exchange capacity. Toiyabe soils have a thin surface layer. Cryumbrepts, wet have a high water table most of the year, are susceptible to puddling, and often have impermeable layers between 1 and 2 feet.

HOE Hoda-Musick complex, 2 to 30 percent slopes

Elevation: 2,000 to 4,000 feet Annual Precipitation: 60 to 80 inches

Typical Vegetation

Mixed conifer-Mixed hardwood series.

Soil Map Unit
Components**Hoda****Musick**

Proportion (percent)

50

35

Soil Profile Description

Surface Layer

0 to 7 inches; brown loam; moderate granular structure; slightly acid.

0 to 8 inches; brown loam; moderate subangular blocky structure; slightly acid.

Subsoil

7 to 72 inches; reddish yellow clay; moderate angular blocky structure; medium acid.

8 to 80 inches; red clay loam; massive; medium acid.

Substratum

Soil Properties & Management InterpretationsEffective Rooting
Depth (inches)

40 to 80

60 to 80

Available Water
Capacity Class

Low to high

Moderate to high

AWC for top 20"

2.6-3.4

3.1-3.6

Permeability: Subsoil
SubstratumSlow
SlowModerately slow
Slow

Drainage Class

Well drained

Well drained

Max Erosion Hazard

High

High

Seedling Mortality

Slight

Slight

Revegetating Exposed
Subsoil

Slight

Slight

Soil Productivity

Forest Survey Site Class
Annual Forage (lbs/acre)1,2 P, WF
240 to 6401,2 P, WF
240 to 640

Soil Manageability

Group
ClassII
2eII
2e

Inclusions

Included in this unit are small areas of Chaix and Holland soils. Included areas make up about 15 percent of the total area.

Management
Considerations

Hoda soils have low subsoil strength when wet.

HOF Hoda-Musick complex, 30 to 50 percent slopes

Elevation: 2,000 to 4,000 feet Annual Precipitation: 60 to 80 inches

Typical Vegetation

Mixed conifer-Mixed hardwood series.

Soil Map Unit
Components

Hoda

Musick

Proportion (percent)

50

35

Soil Profile Description

Surface Layer

0 to 7 inches; brown loam; moderate granular structure; slightly acid.

0 to 8 inches; brown loam; moderate subangular blocky structure; slightly acid.

Subsoil

7 to 72 inches; reddish yellow clay; moderate angular blocky structure; medium acid.

8 to 80 inches; red clay loam; massive; medium acid.

Substratum

Soil Properties & Management Interpretations

Effective Rooting
Depth (inches)

40 to 80

60 to 80

Available Water
Capacity Class

Low to high

Moderate to high

AWC for top 20"

2.6-3.4

3.1-3.6

Permeability: Subsoil
Substratum

Slow
Slow

Moderately slow
Slow

Drainage Class

Well drained

Well drained

Max Erosion Hazard

Very high

Very high

Seedling Mortality

Slight

Slight

Revegetating Exposed
Subsoil

Slight

Slight

Soil Productivity

Forest Survey Site Class
Annual Forage (lbs/acre)

1,2 P, WF
240 to 640

1,2 P, WF
240 to 640

Soil Manageability

Group
Class

III
3E

III
3E

Inclusions

Included in this unit are small areas of Chaix and Holland soils, and shallow coarse-loamy soils with argillic horizons. Included areas make up about 15 percent of the total area.

Management
Considerations

Steep slopes. Hoda soils have low subsoil strength when wet.

HPE Holland-Hoda-Hotaw complex, 2 to 30 percent slopes

Elevation: 2,000 to 4,000 feet Annual Precipitation: 60 to 80 inches

Typical Vegetation

Mixed conifer-Mixed hardwood series.

Soil Map Unit
Components

Holland

Hoda

Hotaw

Proportion (percent)

45

25

20

Soil Profile Description

Surface Layer

0 to 15 inches; brown loam;
weak granular structure;
slightly acid.

0 to 7 inches; brown loam;
moderate granular structure;
slightly acid.

0 to 12 inches; brown loam;
moderate granular structure;
slightly acid.

Subsoil

15 to 65 inches; reddish yellow
clay loam; massive; medium
acid.

7 to 72 inches; reddish yellow
clay; moderate angular blocky
structure; medium acid.

12 to 34 inches; light yellowish
brown sandy clay loam;
moderate subangular blocky
structure; medium acid.

Substratum

34 inches; weathered granitic
rock.

Soil Properties & Management Interpretations

Effective Rooting
Depth (inches)

60 to 100

40 to 80

20 to 40

Available Water
Capacity Class

Moderate to high

Low to high

Low to moderate

AWC for top 20"

2.8-3.5

2.6-3.4

2.9-3.6

Permeability: Subsoil
Substratum

Moderately slow
Slow

Slow
Slow

Moderately slow
Moderately slow

Drainage Class

Well drained

Well drained

Well drained

Max Erosion Hazard

High

High

High

Seedling Mortality

Slight

Slight

Slight

Revegetating Exposed
Subsoil

Slight

Slight

Slight

Soil Productivity

Forest Survey Site Class
Annual Forage (lbs/acre)

1,2 P, WF
240 to 640

1,2 P, WF
240 to 640

2,3 P, DF
50 to 240

Soil Manageability

Group
Class

II
2e

II
2e

II
2e

Inclusions

Included in this unit are small areas of Chaix and Musick soils. Included areas make up about 10 percent of the total area.

Management
Considerations

Hoda soils have low subsoil strength when wet. Hotaw soils are moderately deep.

HPF Holland-Hoda-Hotaw complex, 30 to 50 percent slopes

Elevation: 2,000 to 4,000 feet Annual Precipitation: 60 to 80 inches

Typical Vegetation Mixed conifer-Mixed hardwood series.

Soil Map Unit Components	Holland	Hoda	Hotaw
Proportion (percent)	45	25	20

Soil Profile Description

	Holland	Hoda	Hotaw
Surface Layer	0 to 15 inches; brown loam; weak granular structure; slightly acid.	0 to 7 inches; brown loam; moderate granular structure; slightly acid.	0 to 12 inches; brown loam; moderate granular structure; slightly acid.
Subsoil	15 to 65 inches; reddish yellow clay loam; massive; medium acid.	7 to 72 inches; reddish yellow clay; moderate angular blocky structure; medium acid.	12 to 34 inches; light yellowish brown sandy clay loam; moderate subangular blocky structure; medium acid.
Substratum			34 inches; weathered granitic rock.

Soil Properties & Management Interpretations

	Holland	Hoda	Hotaw
Effective Rooting Depth (inches)	60 to 100	40 to 80	20 to 40
Available Water Capacity Class	Moderate to high	Low to high	Low to moderate
AWC for top 20"	2.8-3.5	2.6-3.4	2.9-3.6
Permeability: Subsoil	Moderately slow	Slow	Moderately slow
Substratum	Slow	Slow	Moderately slow
Drainage Class	Well drained	Well drained	Well drained
Max Erosion Hazard	Very high	Very high	Very high
Seedling Mortality	Slight	Slight	Slight
Revegetating Exposed Subsoil	Slight	Slight	Slight
Soil Productivity			
Forest Survey Site Class	1,2 P, WF	1,2 P, WF	2,3 P, DF
Annual Forage (lbs/acre)	240 to 640	240 to 640	50 to 240
Soil Manageability			
Group	III	III	III
Class	3E	3E	3E

Inclusions Included in this unit are small areas of Chaix and Musick soils. Included areas make up about 10 percent of the total area.

Management Considerations Steep slopes. Hoda soils have low subsoil strength when wet. Hotaw soils are moderately deep.

HPF2 Holland-Hoda-Hotaw complex, 10 to 40 percent slopes, eroded

Elevation: 2,000 to 4,000 feet Annual Precipitation: 60 to 80 inches

Typical Vegetation

Mixed conifer series; Mixed conifer-Mixed hardwood series.

Soil Map Unit Components

Holland, eroded **Hoda, eroded** **Hotaw, eroded**

Proportion (percent)

45 25 20

Soil Profile Description

Surface Layer

0 to 3 inches; reddish yellow loam; weak platy structure; slightly acid. 0 to 2 inches; brown loam; moderate granular structure; slightly acid. 0 to 5 inches; pale brown loam; weak platy structure; slightly acid.

Subsoil

3 to 53 inches; reddish yellow clay loam; massive; medium acid. 2 to 72 inches; reddish yellow clay; moderate angular blocky structure; medium acid. 5 to 21 inches; very pale brown clay loam; massive; medium acid.

Substratum

53 inches; highly weathered granitic rock. 72 inches; highly weathered granitic rock. 21 inches; weathered granitic rock.

Soil Properties & Management Interpretations

Effective Rooting Depth (inches)

60 to 100 40 to 80 20 to 40

Available Water Capacity Class

Low to high Low to moderate Very low to low

AWC for top 20"

2.7-3.4 2.6-3.4 2.7-3.2

Permeability: Subsoil Substratum

Moderately slow Slow Slow Slow Slow Slow Moderately slow Moderately slow

Drainage Class

Well drained Well drained Well drained

Max Erosion Hazard

High High High

Seedling Mortality

Slight Moderate Slight to moderate

Revegetating Exposed Subsoil

Slight Slight Slight

Soil Productivity

Forest Survey Site Class Annual Forage (lbs/acre)

2,3 P, DF Not rated 2,3 P,DF Not rated 3,4 P, DF Not rated

Soil Manageability

Group Class

IV 4E IV 4E IV 4E

Inclusions

Included in this unit are small areas of eroded and uneroded Chaix and Musick soils, and uneroded Hoda, Holland, and Hotaw soils. Included areas make up about 10 percent of the total area.

Management Considerations

Surface soils have been eroded. On-site investigations are necessary to determine if corrective treatments are needed. Hoda soils have low subsoil strength when wet. Hotaw soils are moderately deep.

HPF5 Holland-Hoda-Aquolls complex, 2 to 40 percent slopes, altered

Elevation: 2,000 to 3,000 feet Annual Precipitation: 60 to 80 inches

Typical Vegetation

Grass series.

Soil Map Unit Components

Holland, altered

Hoda, altered

Aquolls

Proportion (percent)

35

20

15

Soil Profile Description

Surface Layer

0 to 3 inches; reddish yellow loam; weak platy structure; slightly acid.

0 to 2 inches; brown loam; moderate granular structure; slightly acid.

Thick and dark colored; stratified coarse sand to clay.

Subsoil

3 to 53 inches; reddish yellow clay loam; massive; medium acid.

2 to 72 inches; reddish yellow clay; moderate angular blocky structure; medium acid.

Stratified layers with mottles; sandy loam to clay; some are very gravelly.

Substratum

53 inches; highly weathered granitic rock.

72 inches; highly weathered granitic rock.

Stratified alluvium.

Soil Properties & Management Interpretations

Effective Rooting Depth (inches)

60 to 100

40 to 80

10 to 30

Available Water Capacity Class

Low to high

Low to moderate

Variable

AWC for top 20"

2.7-3.4

2.6-3.4

Permeability: Subsoil
Substratum

Moderately slow
Slow

Slow
Slow

Variable
Slow and very slow

Drainage Class

Well drained

Well drained

Very poorly drained

Max Erosion Hazard

High

High

High

Seedling Mortality

Slight

Moderate

Slight to moderate

Revegetating Exposed Subsoil

Slight

Slight

Severe

Soil Productivity

Forest Survey Site Class
Annual Forage (lbs/acre)

Not rated
Not rated

Not rated
Not rated

Not capable
Not rated

Soil Manageability

Group
Class

IV
4E

IV
4E

IV
4EW

Inclusions

Included in this unit are small areas of Borolls, Chaix, Hotaw, and Musick soils which are altered and unaltered, and unaltered Aquolls, Hoda, and Holland soils. Included areas make up about 30 percent of the total area.

Management Considerations

Surface soils have been disturbed. On-site investigations are needed to determine if corrective treatments are needed. Hoda soils have low subsoil strength when wet. Aquolls have a high water table during most of the year, are susceptible to puddling, and are subject to flooding.

HRE Horseshoe-Jocal-Mariposa complex, 2 to 30 percent slopes

Elevation: 2,500 to 4,500 feet Annual Precipitation: 50 to 65 inches

Typical Vegetation

Manzanita-Open conifer series; Mixed conifer-Mixed hardwood series.

Soil Map Unit Components

Horseshoe

Jocal

Mariposa

Proportion (percent)

60

15

15

Soil Profile Description

Surface Layer

0 to 9 inches; brown loam; weak subangular blocky structure; slightly acid.

0 to 18 inches; reddish brown loam; weak granular structure; slightly acid.

0 to 6 inches; dark brown gravelly loam; strong granular structure; neutral.

Subsoil

9 to 55 inches; reddish yellow gravelly clay loam; moderate subangular blocky structure; medium acid.

18 to 70 inches; reddish yellow silty clay loam; moderate angular blocky structure; strongly acid.

6 to 33 inches; yellowish red gravelly clay loam; massive; strongly acid.

Substratum

55 to 65 inches; highly weathered silt stone and clay stone.

70 inches; weathered slate and shale.

33 inches; hard and semi-hard metasediments.

Soil Properties & Management Interpretations

Effective Rooting Depth (inches)

40 to 80

40 to 70

15 to 33

Available Water Capacity Class

Low to moderate

Low to high

Low

AWC for top 20"

2.5-3.0

2.4-3.1

2.2-2.8

Permeability: Subsoil Substratum

Moderately slow Slow

Moderately slow Moderately slow

Moderate Moderately slow

Drainage Class

Well drained

Well drained

Well drained

Max Erosion Hazard

High

Moderate

High

Seedling Mortality

Slight

Slight

Moderate to slight

Revegetating Exposed Subsoil

Slight

Slight

Moderate

Soil Productivity

Forest Survey Site Class Annual Forage (lbs/acre)

1,2 DF, P
240 to 640

1,2 DF, P
240 to 640

4,3 P, DF
120 to 170

Soil Manageability

Group Class

II
2e

II
2e

II
2ep

Inclusions

Included in this unit are small areas of Hurlbut and Sites soils, and soils similar to Horseshoe but with brown colors in the surface layer. Included areas make up about 10 percent of the total area.

Management Considerations

Mariposa soils are shallow to moderately deep and have a thin surface layer. These soils reach field capacity rapidly and can produce surface runoff.

HSE Huysink-Horseshoe complex, 2 to 30 percent slopes

Elevation: 4,500 to 5,500 feet Annual Precipitation: 50 to 70 inches

Typical Vegetation Mixed conifer series; Mixed conifer-Black oak series.

Soil Map Unit Components	Huysink	Horseshoe
Proportion (percent)	60	25

Soil Profile Description

Surface Layer	0 to 7 inches; dark yellowish brown very stony loam; weak granular structure; slightly acid.	0 to 9 inches; brown loam; weak subangular blocky structure; slightly acid.
Subsoil	7 to 69 inches; reddish yellow extremely stony loam; moderate subangular blocky structure; medium acid.	9 to 55 inches; reddish yellow gravelly clay loam; moderate subangular blocky structure; medium acid.
Substratum		55 to 65 inches; highly weathered silt stone and clay stone.

Soil Properties & Management Interpretations

Effective Rooting Depth (inches)	40 to 65	40 to 80
Available Water Capacity Class	Very low to low	Low to moderate
AWC for top 20"	1.0-1.4	2.5-3.0
Permeability: Subsoil	Moderate	Moderately slow
Substratum	Slow	Slow
Drainage Class	Well drained	Well drained
Max Erosion Hazard	Moderate	High
Seedling Mortality	Severe	Slight
Revegetating Exposed Subsoil	Slight	Slight
Soil Productivity		
Forest Survey Site Class	2,1 WF, SP	1,2 DF, P
Annual Forage (lbs/acre)	240 to 640	240 to 640
Soil Manageability		
Group	II	II
Class	2ep	2e

Inclusions Included in this unit are small areas of Lorack and Putt soils; soils similar to Horseshoe but with browner colors in the surface layer; soils similar to Huysink and Horseshoe but with thick, dark surface layers; moderately deep, loamy-skeletal soils; and soils without argillic horizons. Included areas make up about 15 percent of the total area.

Management Considerations Huysink soils have a high amount of rock fragments.

HSF Huysink-Horseshoe complex, 30 to 50 percent slopes

Elevation: 4,500 to 5,500 feet Annual Precipitation: 50 to 70 inches

Typical Vegetation

Mixed conifer series; Mixed conifer-Black oak series.

Soil Map Unit Components

Huysink

Horseshoe

Proportion (percent)

60

30

Soil Profile Description

Surface Layer

0 to 7 inches; dark yellowish brown very stony loam; weak granular structure; slightly acid.

0 to 9 inches; brown loam; weak subangular blocky structure; slightly acid.

Subsoil

7 to 69 inches; reddish yellow extremely stony loam; moderate subangular blocky structure; medium acid.

9 to 55 inches; reddish yellow gravelly clay loam; moderate subangular blocky structure; medium acid.

Substratum

55 to 65 inches; highly weathered silt stone and clay stone.

Soil Properties & Management Interpretations

Effective Rooting Depth (inches)

40 to 65

40 to 80

Available Water Capacity Class

Very low to low

Low to moderate

AWC for top 20"

1.0-1.4

2.5-3.0

Permeability: Subsoil
Substratum

Moderate
Slow

Moderately slow
Slow

Drainage Class

Well drained

Well drained

Max Erosion Hazard

High

High

Seedling Mortality

Severe

Slight

Revegetating Exposed Subsoil

Moderate

Slight

Soil Productivity

Forest Survey Site Class
Annual Forage (lbs/acre)

2,1 WF, SP
240 to 640

1,2 DF, P
240 to 640

Soil Manageability

Group
Class

III
3Ep

III
3E

Inclusions

Included in this unit are small areas of soils similar to Huysink which are moderately deep; soils similar to Huysink but with thick, dark surface layers; moderately deep, coarse-loamy soils weathered from rhyolite in the Quaker Hill area; and soils without argillic horizons. Included areas make up about 10 percent of the total area.

Management Considerations

Steep slopes. Huysink soils have a high amount of rock fragments.

HTF Hotaw, rhyolitic substratum-McCarthy-Cryumbrepts, wet complex, 30 to 75 percent slopes

Elevation: 3,000 to 5,000 feet Annual Precipitation: 50 to 60 inches

Typical Vegetation Mixed conifer-Alder/Wollow series.

Soil Map Unit Components	Hotaw, rhyolitic substratum	McCarthy	Cryumbrepts, wet
Proportion (percent)	50	20	15

Soil Profile Description

	Hotaw, rhyolitic substratum	McCarthy	Cryumbrepts, wet
Surface Layer	0 to 12 inches; dark grayish brown gravelly sandy loam; moderate granular structure; slightly acid.	0 to 15 inches; brown gravelly sandy loam; moderate granular structure; slightly acid.	Thick and dark colored; stratified sandy loam, silt loam, and clay loam; gravelly, cobbly, or stony.
Subsoil	12 to 30 inches; light yellowish brown clay loam; moderate subangular blocky structure; slightly acid.	15 to 28 inches; brown very gravelly sandy loam; weak subangular blocky structure; slightly acid.	
Substratum	30 inches; weathered rhyolitic tuff.	28 inches; weathered andesitic tuff breccia.	Stratified loam to clay loam with dark colored mottles; gravelly, cobbly, or stony.

Soil Properties & Management Interpretations

	Hotaw, rhyolitic substratum	McCarthy	Cryumbrepts, wet
Effective Rooting Depth (inches)	20 to 40	20 to 40	Variable
Available Water Capacity Class	Low to moderate	Low	Very low
AWC for top 20"	2.9-3.6	2.3-2.6	
Permeability: Subsoil	Moderately slow	Moderately rapid	Moderately rapid
Permeability: Substratum	Slow	Moderately slow	Very slow
Drainage Class	Well drained	Well drained	Poorly drained
Max Erosion Hazard	Very high	High	Very high
Seedling Mortality	Slight	Moderate	Severe
Revegetating Exposed Subsoil	Slight	Moderate	Severe
Soil Productivity			
Forest Survey Site Class	3,4 P, WF	4 P, WF	Not capable
Annual Forage (lbs/acre)	50 to 240	120 to 170	170 to 640
Soil Manageability			
Group	III	III	III
Class	3E	3Ep	4EW

Inclusions Included in this unit are small areas of Ponto Variant soils and areas of Horseshoe soils on slopes of less than 30 percent. Included areas make up about 15 percent of the total area.

Management Considerations Steep and very steep slopes. Hotaw, rhyolitic substratum soils are moderately deep. McCarthy soils are moderately deep and have a high amount of rock fragments. Cryumbrepts, wet have a high water table most of the year, are susceptible to puddling, and often have impermeable layers between 1 and 2 feet.

HUE Hurlbut-Deadwood-Mariposa complex, 2 to 30 percent slopes

Elevation: 2,000 to 5,000 feet Annual Precipitation: 60 to 65 inches

Typical Vegetation

Mixed conifer-Mixed brush series.

Soil Map Unit Components

Hurlbut

Deadwood

Mariposa

Proportion (percent)

50

20

15

Soil Profile Description

Surface Layer

0 to 4 inches; reddish yellow gravelly loam; moderate subangular blocky and granular structure; medium acid.

0 to 3 inches; dark gray very gravelly sandy loam; weak subangular blocky structure; medium acid.

0 to 6 inches; dark brown gravelly loam; strong granular structure; neutral.

Subsoil

4 to 27 inches; reddish yellow silt loam; weak angular blocky structure; medium acid.

3 to 13 inches; light yellowish brown extremely gravelly sandy loam; weak subangular blocky structure; medium acid.

6 to 33 inches; yellowish red gravelly clay loam; massive; strongly acid.

Substratum

27 inches; weathered metasedimentary rock.

13 inches; hard metasedimentary rock.

33 inches; hard and semi-hard metasediments.

Soil Properties & Management Interpretations

Effective Rooting Depth (inches)

20 to 40

10 to 20

15 to 33

Available Water Capacity Class

Very low to low

Very low

Low

AWC for top 20"

2.1-2.8

0.4-0.7

2.2-2.8

Permeability: Subsoil Substratum

Moderate Moderately slow

Moderately rapid Slow

Moderate Moderately slow

Drainage Class

Well drained

Somewhat excessively drained

Well drained

Max Erosion Hazard

Moderate

High

High

Seedling Mortality

Moderate to slight

Severe

Slight

Revegetating Exposed Subsoil

Slight

Severe

Moderate

Soil Productivity

Forest Survey Site Class Annual Forage (lbs/acre)

4 P 120 to 170

Not capable 20 to 80

3,4 P, DF 120 to 170

Soil Manageability

Group Class

II 2ep

II 3eP

II 2ep

Inclusions

Included in this unit are small areas of Jocal and Jocal Variant soils; Rock outcrop; and soils similar to Hurlbut with more than 35 percent rock fragments. Included areas make up about 15 percent of the total area.

Management Considerations

Hurlbut soils are moderately deep and have a thin surface layer. Deadwood soils are shallow to hard bedrock, have coarse textures, and have a high amount of rock fragments. They reach field capacity rapidly and can produce surface runoff. Mariposa soils are shallow and moderately deep, and have a thin surface layer. These soils reach field capacity rapidly and can produce surface runoff.

**HUE3 Hurlbut, thin surface-Deadwood-Rock outcrop complex,
2 to 30 percent slopes, severely eroded**

Elevation: 3,000 to 5,000 feet Annual Precipitation: 50 to 70 inches

Typical Vegetation Manzanita-Open conifer series.

Soil Map Unit Components	Hurlbut, thin surface	Deadwood, severely eroded	Rock outcrop
Proportion (percent)	45	25	15

Soil Profile Description

	Hurlbut, thin surface	Deadwood, severely eroded	Rock outcrop
Surface Layer	0 to 4 inches; pale brown sandy loam; weak granular structure; medium acid.	0 to 1 inch; brown gravelly loam; weak granular structure; slightly acid.	Metasedimentary rock.
Subsoil	4 to 22 inches; yellow gravelly sandy loam; weak subangular blocky structure; medium acid.	1 to 16 inches; strong brown very cobbly loam; weak subangular blocky structure; medium acid.	
Substratum	22 inches; weathered metasedimentary rock.	16 inches; hard metasedimentary rock.	

Soil Properties & Management Interpretations

	Hurlbut, thin surface	Deadwood, severely eroded
Effective Rooting Depth (inches)	20 to 30	10 to 20
Available Water Capacity Class	Very low	Very low
AWC for top 20"	2.1-2.8	1.6-2.2
Permeability: Subsoil	Moderately slow	Moderately rapid
Substratum	Slow	Slow
Drainage Class	Well drained	Somewhat excessively drained
Max Erosion Hazard	Very high	Very high
Seedling Mortality	Moderate	Severe
Revegetating Exposed Subsoil	Severe	Severe
Soil Productivity		
Forest Survey Site Class	Not rated	Not rated
Annual Forage (lbs/acre)	Not rated	Not rated
Soil Manageability		
Group	III	III
Class	3Ep	4EP

Inclusions Included in this unit are small areas of uneroded Deadwood, Hurlbut, and Mariposa soils. Included areas make up about 15 percent of the total area.

Management Considerations Surface soils have been eroded. On-site investigations are necessary to determine if corrective treatments are needed. Hurlbut, thin surface soils are moderately deep and have a very thin surface layer. Deadwood soils are shallow to hard bedrock, have coarse soil textures, and a high amount of rock fragments. These soils reach field capacity rapidly and can produce surface runoff. Concentrated surface runoff from Rock outcrop areas can increase erosion on adjacent soils. Rock outcrop areas are a potential source of aggregate.

HUE5 Hurlbut, thin surface-Hurlbut-Deadwood complex, 2 to 30 percent slopes, altered

Elevation: 3,000 to 5,000 feet Annual Precipitation: 50 to 65 inches

Typical Vegetation Mixed conifer-Dwarf tanbark series.

Soil Map Unit Components	Hurlbut, thin surface	Hurlbut, altered	Deadwood, altered
Proportion (percent)	40	20	15

Soil Profile Description

Surface Layer	0 to 2 inches; brown loam; weak granular structure; medium acid.	0 to 4 inches; reddish yellow gravelly loam; moderate subangular blocky and granular structure; medium acid.	0 to 2 inches; dark grayish brown gravelly loam; weak granular structure; slightly acid.
Subsoil	2 to 22 inches; reddish yellow gravelly loam; massive; medium acid.	4 to 27 inches; reddish yellow silt loam; weak angular blocky structure; medium acid.	2 to 17 inches; strong brown very cobbly loam; massive; medium acid.
Substratum	22 inches; weathered metasedimentary rock.	27 inches; weathered metasedimentary rock.	17 inches; hard metasedimentary rock.

Soil Properties & Management Interpretations

Effective Rooting Depth (inches)	20 to 30	20 to 40	10 to 20
Available Water Capacity Class	Very low	Very low to low	Very low
AWC for top 20"	2.1-2.8	2.1-2.8	1.8-2.4
Permeability: Subsoil Substratum	Moderately slow Slow	Moderate Moderately slow	Moderately rapid Slow
Drainage Class	Well drained	Well drained	Somewhat excessively drained
Max Erosion Hazard	Very high	Very high	Very high
Seedling Mortality	Moderate	Moderate	Moderate to severe
Revegetating Exposed Subsoil	Severe	Slight	Severe
Soil Productivity Forest Survey Site Class Annual Forage (lbs/acre)	Not rated Not rated	Not rated Not rated	Not rated Not rated
Soil Manageability Group Class	IV 4ep	IV 4ep	IV 4eP

Inclusions Included in this unit are small areas of Jocal and Mariposa soils and Rock outcrop. Included areas make up about 25 percent of the total area.

Management Considerations Hurlbut, thin surface soils are moderately deep and have a very thin surface layer. On-site investigations are needed to determine if corrective treatments are needed. Hurlbut soils are moderately deep and have a thin surface layer. Deadwood soils are shallow to hard bedrock, have coarse textures, and a high amount of rock fragments. These soils reach field capacity rapidly and can produce surface runoff.

HUG Hurlbut-Deadwood-Rock outcrop complex, 30 to 75 percent slopes

Elevation: 2,000 to 5,000 feet Annual Precipitation: 60 to 65 inches

Typical Vegetation

Mixed conifer-Mixed brush series; Mixed conifer-Dwarf tanbark series.

Soil Map Unit Components

	Hurlbut	Deadwood	Rock outcrop
Proportion (percent)	40	20	15

Soil Profile Description

	Hurlbut	Deadwood	Rock outcrop
Surface Layer	0 to 4 inches; reddish yellow gravelly loam; moderate subangular blocky and granular structure; medium acid.	0 to 3 inches; dark gray very gravelly sandy loam; weak subangular blocky structure; medium acid.	Metasedimentary rock.
Subsoil	4 to 27 inches; reddish yellow silt loam; weak angular blocky structure; medium acid.	3 to 13 inches; light yellowish brown extremely gravelly sandy loam; weak subangular blocky structure; medium acid.	
Substratum	27 inches; weathered metasedimentary rock.	13 inches; hard metasedimentary rock.	

Soil Properties & Management Interpretations

	Hurlbut	Deadwood
Effective Rooting Depth (inches)	20 to 40	10 to 20
Available Water Capacity Class	Very low to low	Very low
AWC for top 20"	2.1-2.8	0.4-0.7
Permeability: Subsoil	Moderate	Moderately rapid
Substratum	Moderately slow	Slow
Drainage Class	Well drained	Somewhat excessively drained
Max Erosion Hazard	High	High
Seedling Mortality	Moderate to slight	Severe
Revegetating Exposed Subsoil	Moderate	Severe
Soil Productivity		
Forest Survey Site Class	4,5 P, DF	Not capable
Annual Forage (lbs/acre)	120 to 170	20 to 80
Soil Manageability		
Group	IV	IV
Class	4Ep	4EP

Inclusions

Included in this unit are small areas of Mariposa soils; soils similar to Hurlbut except they have more than 35 percent fork fragments; and deep, loamy-skeletal soils. Included areas make up about 25 percent of the total area.

Management Considerations

Steep and very steep slopes. Hurlbut soils are moderately deep and have a thin surface layer. Deadwood soils are shallow to hard bedrock, have coarse textures, and a high amount of rock fragments. These soils reach field capacity rapidly and can produce surface runoff. Concentrated surface runoff from Rock outcrop areas can increase erosion on adjacent soils. Rock outcrop areas are a potential source of aggregate.

**HUG3 Hurlbut, thin surface-Deadwood-Rock outcrop complex,
30 to 75 percent slopes, severely eroded**

Elevation: 3,000 to 5,000 feet Annual Precipitation: 50 to 65 inches

Typical Vegetation

Mixed conifer-Mixed brush series.

Soil Map Unit
Components

Hurlbut, thin surface	Deadwood, severely eroded	Rock outcrop
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Proportion (percent)

45	30	15
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Soil Profile Description

Surface Layer

0 to 4 inches; pale brown sandy loam; weak granular structure; medium acid.	0 to 1 inch; brown gravelly loam; weak granular structure; slightly acid.	Metasedimentary rock.
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Subsoil

4 to 22 inches; yellow gravelly sandy loam; weak subangular blocky structure; medium acid.	1 to 16 inches; strong brown very cobbly loam; weak subangular blocky structure; medium acid.
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Substratum

22 inches; weathered metasedimentary rock.	16 inches; hard metasedimentary rock.
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Soil Properties & Management Interpretations

Effective Rooting
Depth (inches)

20 to 30	10 to 20
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Available Water
Capacity Class

Very low	Very low
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AWC for top 20"

2.1-2.8	1.6-2.2
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Permeability: Subsoil
Substratum

Moderately slow Slow	Moderately rapid Slow
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Drainage Class

Well drained	Somewhat excessively drained
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Max Erosion Hazard

Very high	Very high
-----------	-----------

Seedling Mortality

Moderate	Severe
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Revegetating Exposed
Subsoil

Severe	Severe
--------	--------

Soil Productivity

Forest Survey Site Class
Annual Forage (lbs/acre)

Not rated	Not rated
Not rated	Not rated

Soil Manageability

Group
Class

IV 4Ep	IV 4EP
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Inclusions

Included in this unit are small areas of Hurlbut and Mariposa soils; and deep soils without a clay increase in the subsoil. Included areas make up about 15 percent of the total area.

Management
Considerations

Steep and very steep slopes. Surface soils have been eroded. On-site investigations are necessary to determine if corrective treatments are needed. Hurlbut, thin surface soils are moderately deep and have a very thin surface layer. Deadwood soils are shallow to hard bedrock, have coarse textures, and a high amount of rock fragments. These soils reach field capacity rapidly and can produce surface runoff. Rock outcrop areas produce concentrated runoff which can increase erosion on adjacent soils. Rock outcrop areas are a potential source of aggregate.

HYE Pits, hydraulic ✓

Elevation: 1,500 to 6,700 feet Annual Precipitation: 50 to 70 inches

Typical Vegetation

Barren; Barren-Mixed brush series.

Soil Map Unit
Components

Pits, hydraulic

Proportion (percent)

85

Soil Profile Description

Surface Layer

Areas of stones, cobbles, and gravel in stream channels created by hydraulic mining.

Subsoil

Substratum

Soil Properties & Management Interpretations

Effective Rooting
Depth (inches)

Available Water
Capacity Class

AWC for top 20"

Permeability: Subsoil
Substratum

Drainage Class

Max Erosion Hazard

Seedling Mortality

Revegetating Exposed
Subsoil

Soil Productivity
Forest Survey Site Class
Annual Forage (lbs/acre)

Soil Manageability
Group
Class

Inclusions

Included in this unit are small areas of Aiken, Cohasset, Horseshoe, Hurlbut, Jocal, and Mariposa soils. Included areas make up about 15 percent of the total area.

Management
Considerations

Hydraulic pits need on-site investigations to determine if watershed restoration is needed.

IME Ledmount-McCarthy-Rock outcrop complex, 2 to 30 percent slopes

Elevation: 2,000 to 5,000 feet Annual Precipitation: 55 to 70 inches

Typical Vegetation Mixed conifer-Black oak series.

Soil Map Unit Components	Ledmount	McCarthy	Rock outcrop
Proportion (percent)	45	25	20

Soil Profile Description

Surface Layer	0 to 18 inches; dark grayish brown sandy loam; moderate granular structure; slightly acid.	0 to 15 inches; brown gravelly sandy loam; moderate granular structure; slightly acid.	Merhten mudflow exposures.
Subsoil		15 to 28 inches; brown very gravelly sandy loam; weak subangular blocky structure; slightly acid.	
Substratum	18 inches; andesitic tuff breccia.	28 inches; weathered andesitic tuff breccia.	

Soil Properties & Management Interpretations

Effective Rooting Depth (inches)	12 to 20	20 to 40
Available Water Capacity Class	Very low	Low
AWC for top 20"	2.3-2.6	2.3-2.6
Permeability: Subsoil	Moderately rapid	Moderately rapid
Substratum	Very slow	Moderately rapid
Drainage Class	Well drained	Well drained
Max Erosion Hazard	High	High
Seedling Mortality	Moderate	Moderate
Revegetating Exposed Subsoil	Severe	Slight
Soil Productivity		
Forest Survey Site Class	Not capable	4 DF, P
Annual Forage (lbs/acre)	20 to 80	120 to 170
Soil Manageability		
Group	II	II
Class	2ep	2ep
Inclusions	Included in this unit are small areas of Crozier and Hurlbut soils; soils similar to Ledmount but with a paralithic contact; and soils with argillic horizons or ochric epipedons. Included areas make up about 10 percent of the total area.	
Management Considerations	Ledmount soils are shallow to hard bedrock. These soils reach field capacity rapidly and can produce surface runoff. McCarthy soils are moderately deep and have a high amount of rock fragments. Concentrated surface runoff from Rock outcrop areas can increase erosion on adjacent soils. Rock outcrop areas are a potential source of aggregate.	

IMG Ledmount-McCarthy-Rock outcrop complex, 30 to 75 percent slopes

Elevation: 2,000 to 5,000 feet Annual Precipitation: 55 to 70 inches

Typical Vegetation Mixed conifer-Black oak series.

Soil Map Unit Components	Ledmount	McCarthy	Rock outcrop
Proportion (percent)	45	25	20

Soil Profile Description

Surface Layer	0 to 18 inches; dark grayish brown sandy loam; moderate granular structure; slightly acid.	0 to 15 inches; brown gravelly sandy loam; moderate granular structure; slightly acid.	Merhten mudflow exposures.
Subsoil		15 to 28 inches; brown very gravelly sandy loam; weak subangular blocky structure; slightly acid.	
Substratum	18 inches; andesitic tuff breccia.	28 inches; weathered andesitic tuff breccia.	

Soil Properties & Management Interpretations

Effective Rooting Depth (inches)	12 to 20	20 to 40
Available Water Capacity Class	Very low	Low
AWC for top 20"	2.3-2.6	2.3-2.6
Permeability: Subsoil	Moderately rapid	Moderately rapid
Substratum	Very slow	Moderately rapid
Drainage Class	Well drained	Well drained
Max Erosion Hazard	High	High
Seedling Mortality	Moderate	Moderate
Revegetating Exposed Subsoil	Severe	Moderate
Soil Productivity		
Forest Survey Site Class	Not capable	4 DF, P
Annual Forage (lbs/acre)	20 to 80	120 to 170
Soil Manageability		
Group	IV	IV
Class	4Ep	4Ep
Inclusions	Included in this unit are small areas of Crozier and Hurlbut soils; soils similar to Ledmount but with a paralithic contact; soils similar to McCarthy but deeper than 40 inches; and soils with argillic horizons or ochric epipedons. Included areas make up about 10 percent of the total area.	
Management Considerations	Steep and very steep slopes. Ledmount soils are shallow to hard bedrock. These soils reach field capacity rapidly and can produce surface runoff. McCarthy soils are moderately deep and have a high amount of rock fragments. Concentrated surface runoff from Rock outcrop areas can increase erosion on adjacent soils. Rock outcrop areas are a potential source of aggregate.	

ISE Forbes-Dubakella complex, 2 to 30 percent slopes

Elevation: 2,500 to 4,500 feet Annual Precipitation: 40 to 60 inches

Typical Vegetation Mixed conifer-California bay series.

Soil Map Unit Components	Forbes	Dubakella
Proportion (percent)	65	20

Soil Profile Description

Surface Layer	0 to 20 inches; dark red gravelly loam; weak granular structure; neutral.	0 to 3 inches; dark red loam; moderate granular structure; slightly acid.
Subsoil	20 to 61 inches; strong brown gravelly silty clay; massive; mildly alkaline.	3 to 32 inches; yellowish red very cobbly clay loam; massive; mildly alkaline.
Substratum		32 inches; serpentinitic bedrock.

Soil Properties & Management Interpretations

Effective Rooting Depth (inches)	40 to 65	20 to 40
Available Water Capacity Class	Low to moderate	Low
AWC for top 20"	1.1-1.3	2.3-2.6
Permeability: Subsoil	Moderately slow to slow	Slow
Substratum	Slow	Slow
Drainage Class	Well drained	Well drained
Max Erosion Hazard	High	High
Seedling Mortality	Moderate to slight	Moderate
Revegetating Exposed Subsoil	Slight	Severe
Soil Productivity		
Forest Survey Site Class	3 P, DF	5 P
Annual Forage (lbs/acre)	50 to 240	70 to 120
Soil Manageability		
Group	II	II
Class	2e	2ep

Inclusions Included in this unit are small areas of soils similar to Dubakella with loamy textures in the subsoil; soils similar to Forbes with more than 35 percent rock fragments in the subsoil; Rock outcrop; soils similar to Forbes with mollic epipedons; and soils similar to Forbes but with brown colors. Included areas make up about 15 percent of the total area.

Management Considerations Reduced fertility due to the serpentinitic nature of the parent material and low subsoil strength when wet. Dubakella soils have a thin surface layer, are moderately deep, and have a high amount of rock fragments.

ISE5 Forbes-Dubakella complex, 2 to 30 percent slopes, altered

Elevation: 3,500 to 4,000 feet Annual Precipitation: 55 to 65 inches

Typical Vegetation

Plantations.

Soil Map Unit
Components

Forbes, altered

Dubakella, altered

Proportion (percent)

65

20

Soil Profile Description

Surface Layer

0 to 13 inches; reddish brown gravelly loam; weak granular structure; neutral.

0 to 4 inches; reddish brown gravelly loam; massive; neutral.

Subsoil

13 to 51 inches; red clay loam; massive; mildly alkaline.

4 to 31 inches; dark reddish brown very cobbly loam; weak subangular blocky structure; neutral.

Substratum

51 inches; highly weathered serpentinized rock.

31 inches; serpentinized bedrock.

Soil Properties & Management Interpretations

Effective Rooting
Depth (inches)

40 to 65

20 to 40

Available Water
Capacity Class

Low to moderate

Low

AWC for top 20"

3.1-3.5

2.2-2.9

Permeability: Subsoil
Substratum

Moderately slow to slow
Slow

Slow
Slow

Drainage Class

Well drained

Well drained

Max Erosion Hazard

High

High

Seedling Mortality

Moderate

Slight to moderate

Revegetating Exposed
Subsoil

Moderate

Severe

Soil Productivity

Forest Survey Site Class
Annual Forage (lbs/acre)

Not rated
Not rated

Not rated
Not rated

Soil Manageability

Group
Class

IV
4E

IV
4Ep

Inclusions

Included in this unit are small areas of Rock outcrop and moderately deep, loamy-skeletal soils. Included areas make up about 15 percent of the total area.

Management
Considerations

Surface soils have been disturbed. On-site investigations are needed to determine if corrective treatments are needed. Reduced fertility due to the serpentinic nature of the parent material. Low subsoil strength when wet. Dubakella soils have thin surface layers, are moderately deep, and have a high amount of rock fragments.

ISF Forbes-Dubakella complex, 30 to 50 percent slopes

Elevation: 2,500 to 4,500 feet Annual Precipitation: 40 to 60 inches

Typical Vegetation

Mixed conifer-California bay series.

Soil Map Unit
Components

Forbes

Dubakella

Proportion (percent)

65

20

Soil Profile Description

Surface Layer

0 to 20 inches; dark red gravelly loam; weak granular structure; neutral.

0 to 3 inches; dark red loam; moderate granular structure; slightly acid.

Subsoil

20 to 61 inches; strong brown gravelly silty clay; massive; mildly alkaline.

3 to 32 inches; yellowish red very cobbly clay loam; massive; mildly alkaline.

Substratum

32 inches; serpentinitic bedrock.

Soil Properties & Management Interpretations

Effective Rooting
Depth (inches)

40 to 65

20 to 40

Available Water
Capacity Class

Low to moderate

Low

AWC for top 20"

2.4-2.9

2.3-2.6

Permeability: Subsoil
Substratum

Moderately slow to slow
Slow

Slow
Slow

Drainage Class

Well drained

Well drained

Max Erosion Hazard

High

High

Seedling Mortality

Moderate to slight

Moderate

Revegetating Exposed
Subsoil

Slight

Severe

Soil Productivity

Forest Survey Site Class
Annual Forage (lbs/acre)

3 P, DF
50 to 240

5 P
70 to 120

Soil Manageability

Group
Class

III
3E

III
3Ep

Inclusions

Included in this unit are small areas of Rock outcrop; soils similar to Dubakella with loamy textures in the subsoil; soils similar to Forbes with mollic epipedons and/or loamy textures in the subsoil; and moderately deep, loamy-skeletal soils. Included areas make up about 15 percent of the total area.

Management
Considerations

Steep slopes. Reduced fertility due to the serpentinitic nature of the parent material. Low subsoil strength when wet. Dubakella soils have thin surface layers, are moderately deep, and have a high amount of rock fragments.

JSE Jorge-Cryumbrepts, wet-Tahoma complex, 2 to 30 percent slopes

Elevation: 6,000 to 8,000 feet Annual Precipitation: 35 to 45 inches

Typical Vegetation

Mixed conifer-Alder/Willow series; Red fir-Alder/Willow series.

Soil Map Unit Components

Jorge	Cryumbrepts, wet	Tahoma
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Proportion (percent)

55	15	15
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Soil Profile Description

Surface Layer

0 to 13 inches; brown sandy loam; weak granular structure; slightly acid.

Thick and dark colored; stratified sandy loam, silt loam, and clay loam; gravelly, cobbly, or stony.

0 to 8 inches; brown gravelly loam; moderate granular structure; slightly acid.

Subsoil

13 to 41 inches; brown very cobbly sandy loam; weak subangular blocky structure; medium acid.

8 to 41 inches; strong brown gravelly clay loam; weak subangular blocky structure; neutral.

Substratum

41 to 47 inches; brown very cobbly sandy loam; massive; strongly acid.

Stratified loam to clay loam with dark colored mottles; gravelly, cobbly, or stony.

41 inches; highly weathered andesitic tuff.

Soil Properties & Management Interpretations

Effective Rooting Depth (inches)

40 to 60

Variable

40 to 60

Available Water Capacity Class

Very low to low

Very low

Low

AWC for top 20"

1.7-1.8

2.3-2.7

Permeability: Subsoil
Substratum

Moderate
Moderate

Moderately rapid
Very slow

Moderately slow
Moderately slow

Drainage Class

Well drained

Poorly drained

Well drained

Max Erosion Hazard

High

Very high

High

Seedling Mortality

Moderate

Severe

Slight

Revegetating Exposed Subsoil

Slight

Severe

Slight

Soil Productivity

Forest Survey Site Class
Annual Forage (lbs/acre)

4 RF, WF
100 to 140

Not capable
170 to 640

3,4 RF, WF
100 to 180

Soil Manageability

Group
Class

II
2p

II
4EW

II
2ep

Inclusions

Included in this unit are small areas of Fugawee soils, Rubble land, and soils similar to Jorge without a clay increase in the subsoil. Included areas make up about 15 percent of the total area.

Management Considerations

Jorge soils have coarse textures and a high amount of rock fragments. Cryumbrepts, wet have a high water table most of the year, are susceptible to puddling, and often have an impermeable layer between 1 and 2 feet.

JTE Jorge-Tahoma complex, 2 to 30 percent slopes

Elevation: 6,000 to 8,000 feet Annual Precipitation: 35 to 45 inches

Typical Vegetation Mixed conifer series; Red fir series.

Soil Map Unit Components	Jorge	Tahoma
Proportion (percent)	65	20

Soil Profile Description

Surface Layer	0 to 13 inches; brown sandy loam; weak granular structure; slightly acid.	0 to 8 inches; brown gravelly loam; moderate granular structure; slightly acid.
Subsoil	13 to 41 inches; brown very cobbly sandy loam; weak subangular blocky structure; medium acid.	8 to 41 inches; strong brown gravelly clay loam; weak subangular blocky structure; neutral.
Substratum	41 to 47 inches; brown very cobbly sandy loam; massive; strongly acid.	41 inches; highly weathered andesitic tuff.

Soil Properties & Management Interpretations

Effective Rooting Depth (inches)	40 to 60	40 to 60
Available Water Capacity Class	Very low to low	Low
AWC for top 20"	1.7-1.8	2.3-2.7
Permeability: Subsoil	Moderate	Moderately slow
Substratum	Moderate	Moderately slow
Drainage Class	Well drained	Well drained
Max Erosion Hazard	High	High
Seedling Mortality	Moderate	Slight
Revegetating Exposed Subsoil	Slight	Slight
Soil Productivity		
Forest Survey Site Class	4 RF, WF	3,4 RF, WF
Annual Forage (lbs/acre)	100 to 140	100 to 180
Soil Manageability		
Group	II	II
Class	2p	2ep
Inclusions	Included in this unit are small areas of Fugawee soils, Rubble land, and soils similar to Jorge without a clay increase in the subsoil. Included areas make up about 15 percent of the total area.	
Management Considerations	Jorge soils have coarse textures and a high amount of rock fragments.	

JTF Jorge very stony sandy loam, 30 to 50 percent slopes

Elevation: 6,000 to 9,000 feet Annual Precipitation: 35 to 45 inches

Typical Vegetation	Mixed conifer series; Red fir series.
Soil Map Unit Components	Jorge very stony sandy loam
Proportion (percent)	85

Soil Profile Description

Surface Layer	0 to 13 inches; brown very stony sandy loam; weak granular structure; slightly acid.
Subsoil	13 to 41 inches; brown very cobbly sandy loam; weak subangular blocky structure; medium acid.
Substratum	41 to 47 inches; brown very cobbly sandy loam; massive; strongly acid.

Soil Properties & Management Interpretations

Effective Rooting Depth (inches)	40 to 60
Available Water Capacity Class	Very low to low
AWC for top 20"	1.7-1.8
Permeability: Subsoil	Moderate
Substratum	Moderate
Drainage Class	Well drained
Max Erosion Hazard	High
Seedling Mortality	Moderate
Revegetating Exposed Subsoil	Slight
Soil Productivity	
Forest Survey Site Class	4 RF, WF
Annual Forage (lbs/acre)	100 to 140
Soil Manageability	
Group	III
Class	3epX
Inclusions	Included in this unit are small areas of Fugawee and Tahoma soils, Rubble land, and soils similar to Jorge without a clay increase in the subsoil. Included areas make up about 15 percent of the total area.
Management Considerations	Steep slopes. Jorge soils have coarse textures and a high amount of rock fragments.

JUE Jorge-Rubble land complex, 2 to 30 percent slopes

Elevation: 6,000 to 9,000 feet Annual Precipitation: 35 to 45 inches

Typical Vegetation

Mixed conifer-Barren series; Red fir-Barren series.

Soil Map Unit
Components

Jorge

Rubble land

Proportion (percent)

55

30

Soil Profile Description

Surface Layer

0 to 13 inches; brown sandy loam; weak granular structure; slightly acid.

Angular stones and cobbles. Some soil material between fragments.

Subsoil

13 to 41 inches; brown very cobbly sandy loam; weak subangular blocky structure; medium acid.

Substratum

41 to 47 inches; brown very cobbly sandy loam; massive; strongly acid.

Soil Properties & Management Interpretations

Effective Rooting
Depth (inches)

40 to 60

Available Water
Capacity Class

Very low to low

AWC for top 20"

1.7-1.8

Permeability: Subsoil
Substratum

Moderate
Moderate

Drainage Class

Well drained

Max Erosion Hazard

High

Seedling Mortality

Moderate

Revegetating Exposed
Subsoil

Slight

Soil Productivity

Forest Survey Site Class
Annual Forage (lbs/acre)

4 RF, WF
100 to 140

Soil Manageability

Group
Class

II
2p

Inclusions

Included in this unit are small areas of Fugawee and Tahoma soils and soils similar to Jorge without a clay increase in the subsoil. Included areas make up about 15 percent of the total area.

Management
Considerations

Jorge soils have coarse textures and a high amount of rock fragments. Rubble land areas are a potential source of aggregate.

JWE Jorge-Waca-Tahoma complex, 2 to 30 percent slopes

Elevation: 6,000 to 8,000 feet Annual Precipitation: 35 to 45 inches

Typical Vegetation

Mixed conifer series; Red fir series.

Soil Map Unit
Components

Jorge

Waca

Tahoma

Proportion (percent)

40

25

20

Soil Profile Description

Surface Layer

0 to 13 inches; brown sandy loam; weak granular structure; slightly acid.

0 to 12 inches; grayish brown gravelly sandy loam; moderate granular structure; medium acid.

0 to 8 inches; brown gravelly loam; moderate granular structure; slightly acid.

Subsoil

13 to 41 inches; brown very cobbly sandy loam; weak subangular blocky structure; medium acid.

12 to 32 inches; yellowish brown very gravelly sandy loam; massive; medium acid.

8 to 41 inches; strong brown gravelly clay loam; weak subangular blocky structure; neutral.

Substratum

41 to 47 inches; brown very cobbly sandy loam; massive; strongly acid.

32 inches; weathered andesitic tuff breccia.

41 inches; highly weathered andesitic tuff.

Soil Properties & Management Interpretations

Effective Rooting
Depth (inches)

40 to 60

20 to 40

40 to 60

Available Water
Capacity Class

Very low to low

Low

Low

AWC for top 20"

1.7-1.8

2.1-2.3

2.3-2.7

Permeability: Subsoil
Substratum

Moderate
Moderate

Moderately rapid
Slow

Moderately slow
Moderately slow

Drainage Class

Well drained

Well drained

Well drained

Max Erosion Hazard

High

Moderate

High

Seedling Mortality

Moderate

Moderate to slight

Slight

Revegetating Exposed
Subsoil

Slight

Slight

Slight

Soil Productivity

Forest Survey Site Class
Annual Forage (lbs/acre)

4 RF, WF
100 to 140

4,5 RF, WF
60 to 140

3,4 RF, WF
100 to 180

Soil Manageability

Group
Class

II
2p

II
2ep

II
2ep

Inclusions

Included in this unit are small areas of Fugawee and Windy soils, and soils similar to Jorge without a clay increase in the subsoil. Included areas make up about 15 percent of the total area.

Management
Considerations

Jorge soils have coarse textures and a high amount of rock fragments. Waca soils are moderately deep, have a high amount of rock fragments, and snowmelt tends to accumulate for short periods over the impermeable substratum.

JWF Jorge-Waca-Tahoma complex, 30 to 50 percent slopes

Elevation: 6,000 to 8,000 feet Annual Precipitation: 35 to 45 inches

Typical Vegetation Mixed conifer series; Red fir series.

Soil Map Unit Components	Jorge	Waca	Tahoma
Proportion (percent)	40	25	20

Soil Profile Description

Soil Profile Description	Jorge	Waca	Tahoma
Surface Layer	0 to 13 inches; brown sandy loam; weak granular structure; slightly acid.	0 to 12 inches; grayish brown gravelly sandy loam; moderate granular structure; medium acid.	0 to 8 inches; brown gravelly loam; moderate granular structure; slightly acid.
Subsoil	13 to 41 inches; brown very cobbly sandy loam; weak subangular blocky structure; medium acid.	12 to 32 inches; yellowish brown very gravelly sandy loam; massive; medium acid.	8 to 41 inches; strong brown gravelly clay loam; weak subangular blocky structure; neutral.
Substratum	41 to 47 inches; brown very cobbly sandy loam; massive; strongly acid.	32 inches; weathered andesitic tuff breccia.	41 inches; highly weathered andesitic tuff.

Soil Properties & Management Interpretations

Soil Properties & Management Interpretations	Jorge	Waca	Tahoma
Effective Rooting Depth (inches)	40 to 60	20 to 40	40 to 60
Available Water Capacity Class	Very low to low	Low	Low
AWC for top 20"	1.7-1.8	2.1-2.3	2.3-2.7
Permeability: Subsoil	Moderate	Moderately rapid	Moderately slow
Substratum	Moderate	Slow	Moderately slow
Drainage Class	Well drained	Well drained	Well drained
Max Erosion Hazard	High	High	High
Seedling Mortality	Moderate	Moderate to slight	Slight
Revegetating Exposed Subsoil	Slight	Slight	Slight
Soil Productivity			
Forest Survey Site Class	4 RF, WF	4,5 RF, WF	3,4 RF, WF
Annual Forage (lbs/acre)	100 to 140	60 to 140	100 to 180
Soil Manageability			
Group	III	III	III
Class	3ep	3ep	3ep
Inclusions	Included in this unit are small areas of Fugawee and Windy soils, and soils similar to Jorge without a clay increase in the subsoil. Included areas make up about 15 percent of the total area.		
Management Considerations	Steep slopes. Jorge soils have coarse textures and a high amount of rock fragments. Waca soils are moderately deep, have a high amount of rock fragments, and snowmelt tends to accumulate for short periods over the impermeable substratum.		

JXE Jorge-Waca-Cryumbrepts, wet complex, 2 to 30 percent slopes

Elevation: 6,000 to 8,000 feet Annual Precipitation: 35 to 45 inches

Typical Vegetation

Mixed conifer-Alder/Willow series; Red fir-Alder/Willow series.

Soil Map Unit Components

Jorge

Waca

Cryumbrepts, wet

Proportion (percent)

25

25

20

Soil Profile Description

Surface Layer

0 to 13 inches; brown sandy loam; weak granular structure; slightly acid.

0 to 12 inches; grayish brown gravelly sandy loam; moderate granular structure; medium acid.

Thick and dark colored; stratified sandy loam, silt loam, and clay loam; gravelly, cobbly, or stony.

Subsoil

13 to 41 inches; brown very cobbly sandy loam; weak subangular blocky structure; medium acid.

12 to 32 inches; yellowish brown very gravelly sandy loam; massive; medium acid.

Substratum

41 to 47 inches; brown very cobbly sandy loam; massive; strongly acid.

32 inches; weathered andesitic tuff breccia.

Stratified loam to clay loam with dark colored mottles; gravelly, cobbly, or stony.

Soil Properties & Management Interpretations

Effective Rooting Depth (inches)

40 to 60

20 to 40

Variable

Available Water Capacity Class

Very low to low

Low

Very low

AWC for top 20"

1.7-1.8

2.1-2.3

Permeability: Subsoil Substratum

Moderate Moderate

Moderately rapid Slow

Moderately rapid Very slow

Drainage Class

Well drained

Well drained

Poorly drained

Max Erosion Hazard

High

Moderate

Very high

Seedling Mortality

Moderate

Moderate to slight

Severe

Revegetating Exposed Subsoil

Slight

Slight

Severe

Soil Productivity

Forest Survey Site Class Annual Forage (lbs/acre)

4 RF, WF
100 to 140

4,5 RF, WF
60 to 140

Not capable
170 to 640

Soil Manageability

Group Class

II
2p

II
2ep

II
4EW

Inclusions

Included in this unit are small areas of Fugawee, Tahoma, and Windy soils. Included areas make up about 30 percent of the total area.

Management Considerations

Jorge soils have coarse textures with a high amount of rock fragments. Waca soils are moderately deep, have a high amount of rock fragments, and snowmelt tends to accumulate for sort periods over the impermeable substratum. Cryumbrepts, wet have a high watertable most of the year, are susceptible to puddling, and often have impermeable layers between 1 and 2 feet.

JXF Jorge-Waca-Cryumbrepts, wet complex, 30 to 50 percent slopes

Elevation: 6,000 to 8,000 feet Annual Precipitation: 35 to 45 inches

Typical Vegetation

Mixed conifer-Alder/Willow series; Red fir-Alder/Willow series.

Soil Map Unit Components

Jorge	Waca	Cryumbrepts, wet
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Proportion (percent)

25	25	20
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Soil Profile Description

Surface Layer

0 to 13 inches; brown sandy loam; weak granular structure; slightly acid.	0 to 12 inches; grayish brown gravelly sandy loam; moderate granular structure; medium acid.	Thick and dark colored; stratified sandy loam, silt loam, and clay loam; gravelly, cobbly, or stony.
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Subsoil

13 to 41 inches; brown very cobbly sandy loam; weak subangular blocky structure; medium acid.	12 to 32 inches; yellowish brown very gravelly sandy loam; massive; medium acid.
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Substratum

41 to 47 inches; brown very cobbly sandy loam; massive; strongly acid.	32 inches; weathered andesitic tuff breccia.	Stratified loam to clay loam with dark colored mottles; gravelly, cobbly, or stony.
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Soil Properties & Management Interpretations

Effective Rooting Depth (inches)

40 to 60	20 to 40	Variable
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Available Water Capacity Class

Very low to low	Low	Very low
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AWC for top 20"

1.7-1.8	2.1-2.3
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Permeability: Subsoil Substratum

Moderate	Moderately rapid	Moderately rapid
Moderate	Slow	Very slow

Drainage Class

Well drained	Well drained	Poorly drained
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Max Erosion Hazard

High	High	Very high
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Seedling Mortality

Moderate	Moderate to slight	Severe
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Revegetating Exposed Subsoil

Slight	Slight	Severe
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Soil Productivity

Forest Survey Site Class Annual Forage (lbs/acre)

4 RF, WF 100 to 140	4,5 RF, WF 60 to 140	Not capable 170 to 640
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Soil Manageability

Group Class

III 3ep	III 3Ep	III 4EW
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Inclusions

Included in this unit are small areas of Fugawee, Tahoma, and Windy soils. Included areas make up about 30 percent of the total area.

Management Considerations

Steep slopes. Jorge soils have coarse textures with a high amount of rock fragments. Waca soils are moderately deep, have a high amount of rock fragments, and snowmelt tends to accumulate for short periods over the impermeable substratum. Cryumbrepts, wet have a high water table most of the year, are susceptible to puddling, and often have impermeable layers between 1 and 2 feet.

JYE Jocal-Sites-Mariposa complex, 2 to 30 percent slopes

Elevation: 2,000 to 5,000 feet Annual Precipitation: 50 to 60 inches

Typical Vegetation

Mixed conifer series; Mixed conifer-Mixed hardwood series.

Soil Map Unit Components

Jocal	Sites	Mariposa
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Proportion (percent)

50	20	15
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Soil Profile Description

Surface Layer

0 to 18 inches; reddish brown loam; weak granular structure; slightly acid.	0 to 9 inches; reddish brown clay loam; moderate subangular blocky structure; slightly acid.	0 to 6 inches; dark brown gravelly loam; strong granular structure; neutral.
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Subsoil

18 to 70 inches; reddish yellow silty clay loam; moderate angular blocky structure; strongly acid.	9 to 45 inches; yellowish red gravelly clay; strong subangular blocky structure; medium acid.	6 to 33 inches; yellowish red gravelly clay loam; massive; strongly acid.
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Substratum

70 inches; weathered slate and shale.	45 inches; weathered metasedimentary rock.	33 inches; hard and semi-hard metasediments.
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Soil Properties & Management Interpretations

Effective Rooting Depth (inches)

40 to 70	40 to 65	15 to 33
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Available Water Capacity Class

Low to high	Low to moderate	Low
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AWC for top 20"

2.4-3.1	2.6-3.1	2.2-2.8
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Permeability: Subsoil
Substratum

Moderately slow Moderately slow	Moderately slow to slow Slow	Moderate Moderately slow
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Drainage Class

Well drained	Well drained	Well drained
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Max Erosion Hazard

Moderate	High	High
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Seedling Mortality

Slight	Moderate to slight	Moderate to slight
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Revegetating Exposed Subsoil

Slight	Slight	Moderate
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Soil Productivity

Forest Survey Site Class
Annual Forage (lbs/acre)

1,2 DF, P 240 to 640	1,2 DF, P 240 to 640	4,3 P, DF 120 to 170
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Soil Manageability

Group
Class

II 2e	II 2e	II 2ep
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Inclusions

Included in this unit are small areas of Aiken, Cohasset, Crozier, and Hurlbut soils. Included areas make up about 15 percent of the total area.

Management Considerations

Sites soils have low subsoil strength when wet. Mariposa soils are shallow and moderately deep, have a thin surface layer, and they reach field capacity rapidly and can produce surface runoff.

JYE5 Jocal-Sites-Mariposa complex, 2 to 30 percent slopes, altered

Elevation: 2,000 to 5,000 feet Annual Precipitation: 50 to 60 inches

Typical Vegetation ✓

Plantation; Grass series.

Soil Map Unit Components

Jocal, altered

Sites, altered

Mariposa, altered

Proportion (percent)

50

20

15

Soil Profile Description

Surface Layer

0 to 9 inches; reddish brown loam; weak granular structure; slightly acid.

0 to 4 inches; dark reddish brown loam; moderate granular structure; slightly acid.

0 to 6 inches; brown loam; weak granular structure; slightly acid.

Subsoil

9 to 50 inches; reddish brown gravelly clay loam; weak subangular blocky structure; medium acid.

4 to 43 inches; reddish yellow cobbly clay; massive; medium acid.

6 to 21 inches; reddish brown cobbly clay loam; weak angular blocky structure; medium acid.

Substratum

metasedimentary rock.

43 inches; weathered metasedimentary rock.

21 inches; weathered metasedimentary rock.

Soil Properties & Management Interpretations

Effective Rooting Depth (inches)

40 to 70

40 to 65

15 to 33

Available Water Capacity Class

Low to moderate

Low to moderate

Very low to low

AWC for top 20"

2.2-3.0

2.7-3.3

2.7-3.2

Permeability: Subsoil Substratum

Moderately slow
Moderately slow

Moderately slow to slow
Slow

Moderate
Moderately slow

Drainage Class

Well drained

Well drained

Well drained

Max Erosion Hazard

High

High

High

Seedling Mortality

Slight to moderate

Slight to moderate

Slight to moderate

Revegetating Exposed Subsoil

Slight

Slight

Moderate

Soil Productivity

Forest Survey Site Class
Annual Forage (lbs/acre)

Not rated
Not rated

Not rated
Not rated

Not rated
Not rated

Soil Manageability

Group
Class

IV
4e

IV
4e

IV
4ep

Inclusions

Included in this unit are small areas of Aiken, Cohasset, Crozier, and Hurlbut soils. Included areas make up about 15 percent of the total area.

Management Considerations

Soils have been disturbed. On-site investigations are needed to determine if corrective treatments are needed. Sites soils have low subsoil strength when wet. Mariposa soils are shallow and moderately deep, have a thin surface layer, and they reach field capacity rapidly and can produce surface runoff.

JYF Jocal-Sites-Mariposa complex, 30 to 50 percent slopes

Elevation: 2,000 to 5,000 feet Annual Precipitation: 50 to 60 inches

Typical Vegetation

Mixed conifer series; Mixed conifer-Mixed hardwood series.

Soil Map Unit Components

Jocal

Sites

Mariposa

Proportion (percent)

50

20

15

Soil Profile Description

Surface Layer

0 to 18 inches; reddish brown loam; weak granular structure; slightly acid.

0 to 9 inches; reddish brown clay loam; moderate subangular blocky structure; slightly acid.

0 to 6 inches; dark brown gravelly loam; strong granular structure; neutral.

Subsoil

18 to 70 inches; reddish yellow silty clay loam; moderate angular blocky structure; strongly acid.

9 to 45 inches; yellowish red gravelly clay; strong subangular blocky structure; medium acid.

6 to 33 inches; yellowish red gravelly clay loam; massive; strongly acid.

Substratum

70 inches; weathered slate and shale.

45 inches; weathered metasedimentary rock.

33 inches; hard and semi-hard metasediments.

Soil Properties & Management Interpretations

Effective Rooting Depth (inches)

40 to 70

40 to 65

15 to 33

Available Water Capacity Class

Low to high

Low to moderate

Low

AWC for top 20"

2.4-3.1

2.6-3.1

2.2-2.8

Permeability: Subsoil
Substratum

Moderately slow
Moderately slow

Moderately slow to slow
Slow

Moderate
Moderately slow

Drainage Class

Well drained

Well drained

Well drained

Max Erosion Hazard

High

High

High

Seedling Mortality

Slight

Moderate to slight

Moderate to slight

Revegetating Exposed Subsoil

Slight

Slight

Moderate

Soil Productivity

Forest Survey Site Class
Annual Forage (lbs/acre)

1,2 DF, P
240 to 640

1,2 DF, P
240 to 640

3,4 P, DF
120 to 170

Soil Manageability

Group
Class

III
3E

III
3E

III
3Ep

Inclusions

Included in this unit are small areas of Aiken, Cohasset, Crozier, and Hurlbut soils. Included areas make up about 15 percent of the total area.

Management Considerations

Steep slopes. Sites soils have low subsoil strength when wet. Mariposa soils are shallow and moderately deep, have a thin surface layer, and they reach field capacity rapidly and can produce surface runoff.

JZG Jocal-Jocal Variant-Cryumbrepts, wet complex, 50 to 75 percent slopes.

Elevation: 2,000 to 5,000 feet Annual Precipitation: 45 to 65 inches

Typical Vegetation

Mixed conifer-Dogwood/Maple series; Mixed conifer-Mixed hardwood series.

Soil Map Unit Components

Jocal	Jocal Variant	Cryumbrepts, wet
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Proportion (percent)

40	30	15
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Soil Profile Description

Surface Layer

0 to 18 inches; reddish brown loam; weak granular structure; slightly acid.	0 to 5 inches; light brown gravelly silt loam; weak granular structure; slightly acid.	Thick and dark colored; stratified sandy loam, silt loam, and clay loam; gravelly, cobbly, or stony.
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Subsoil

18 to 70 inches; reddish yellow silty clay loam; moderate angular blocky structure; strongly acid.	5 to 65 inches; reddish yellow very gravelly clay loam; weak subangular blocky structure; medium acid.
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Substratum

70 inches; weathered slate and shale.	Stratified loam to clay loam with dark colored mottles; gravelly, cobbly, or stony.
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Soil Properties & Management Interpretations

Effective Rooting Depth (inches)

40 to 70	60 to 80	Variable
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Available Water Capacity Class

Low to high	Low to moderate	Very low
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AWC for top 20"

2.4-3.1	1.8-2.1
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Permeability: Subsoil
Substratum

Moderately slow	Moderately slow	Moderately rapid
Moderately slow	Moderately slow	Very slow

Drainage Class

Well drained	Well drained	Poorly drained
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Max Erosion Hazard

High	High	Very high
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Seedling Mortality

Slight	Moderate	Severe
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Revegetating Exposed Subsoil

Slight	Slight	Severe
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Soil Productivity

Forest Survey Site Class
Annual Forage (lbs/acre)

1,2 DF, P	3,4 P, DF	Not capable
Not rated	Not rated	Not rated

Soil Manageability

Group
Class

IV	IV	IV
4E	4Ep	4EW

Inclusions

Included in this unit are small areas of Hurlbut and Mariposa soils; soils similar to Hurlbut but with more than 35 percent rock fragments; soils similar to Jocal but without a clay increase in the subsoil; soils similar to Jocal but with more than 35 percent rock fragments; and soils similar to Jocal but with yellower colors (10YR hue). Included areas make up about 15 percent of the total area.

Management Considerations

Very steep slopes. Jocal Variant soils have a high amount of rock fragments. Cryumbrepts, wet soils have a high water table most of the year, are susceptible to puddling, and often have impermeable layers between 1 and 2 feet.

KIE Kinkel Variant-Cohasset complex, 2 to 30 percent slopes

Elevation: 4,800 to 5,800 feet Annual Precipitation: 60 to 70 inches

Typical Vegetation

Mixed conifer-Mixed brush series; Mixed conifer-Mixed hardwood series.

Soil Map Unit
Components

Kinkel Variant

Cohasset

Proportion (percent)

50

35

Soil Profile Description

Surface Layer

0 to 14 inches; dark reddish brown gravelly sandy loam; weak granular structure; medium acid.

0 to 12 inches; brown loam; moderate granular structure; slightly acid.

Subsoil

14 to 54 inches; strong brown very gravelly clay loam; massive; medium acid.

12 to 61 inches; yellowish red clay loam; weak angular blocky structure; slightly acid.

Substratum

54 inches; weathered andesitic rock.

61 inches; weathered andesitic conglomerate.

Soil Properties & Management Interpretations

Effective Rooting
Depth (inches)

40 to 60

40 to 80

Available Water
Capacity Class

Very low to low

Moderate to high

AWC for top 20"

1.5-1.9

2.6-3.4

Permeability: Subsoil
Substratum

Moderate

Moderately slow

Moderate

Slow

Drainage Class

Well drained

Well drained

Max Erosion Hazard

High

Moderate

Seedling Mortality

Severe to moderate

Slight

Revegetating Exposed
Subsoil

Slight

Slight

Soil Productivity

Forest Survey Site Class
Annual Forage (lbs/acre)

3,4 P, WF

1,2 DF, P

50 to 240

240 to 640

Soil Manageability

Group
Class

II

II

2p

2e

Inclusions

Included in this unit are small areas of Crozier and McCarthy soils. Included areas make up about 15 percent of the total area.

Management
Considerations

Kinkel Variant soils have a high amount of rock fragments.

KIF Kinkel Variant-Cohasset complex, 30 to 50 percent slopes

Elevation: 4,800 to 5,500 feet Annual Precipitation: 60 to 70 inches

Typical Vegetation

Mixed conifer-Mixed brush series; Mixed conifer-Mixed hardwood series.

Soil Map Unit Components

Kinkel Variant

Cohasset

Proportion (percent)

60

25

Soil Profile Description

Surface Layer

0 to 14 inches; dark reddish brown gravelly sandy loam; weak granular structure; medium acid.

0 to 12 inches; brown loam; moderate granular structure; slightly acid.

Subsoil

14 to 54 inches; strong brown very gravelly clay loam; massive; medium acid.

12 to 61 inches; yellowish red clay loam; weak angular blocky structure; slightly acid.

Substratum

54 inches; weathered andesitic rock.

61 inches; weathered andesitic conglomerate.

Soil Properties & Management Interpretations

Effective Rooting Depth (inches)

40 to 60

40 to 80

Available Water Capacity Class

Very low to low

Moderate to high

AWC for top 20"

1.5-1.9

2.6-3.4

Permeability: Subsoil
Substratum

Moderate
Moderate

Moderately slow
Slow

Drainage Class

Well drained

Well drained

Max Erosion Hazard

High

High

Seedling Mortality

Severe to moderate

Slight

Revegetating Exposed Subsoil

Slight

Slight

Soil Productivity

Forest Survey Site Class
Annual Forage (lbs/acre)

3,4 P, WF
50 to 240

1,2 DF, P
240 to 640

Soil Manageability

Group
Class

III
3ep

III
3E

Inclusions

Included in this unit are small areas of Crozier and McCarthy soils. Included areas make up about 15 percent of the total area.

Management Considerations

Steep slopes. Kinkel Variant soils have a high amount of rock fragments.

KJF Kinkel Variant-Rock outcrop complex, 2 to 40 percent slopes

Elevation: 4,800 to 5,500 feet Annual Precipitation: 60 to 70 inches

Typical Vegetation Mixed conifer-Mixed brush series.

Soil Map Unit **Kinkel Variant** **Rock outcrop**

Components
Proportion (percent) 60 25

Soil Profile Description

Surface Layer 0 to 14 inches; dark reddish brown gravelly sandy loam; weak granular structure; medium acid. Basalt rock.

Subsoil 14 to 54 inches; strong brown very gravelly clay loam; massive; medium acid.

Substratum 54 inches; weathered andesitic rock.

Soil Properties & Management Interpretations

Effective Rooting Depth (inches) 40 to 60

Available Water Capacity Class Very low to low

AWC for top 20" 1.5-1.9

Permeability: Subsoil Moderate
Substratum Moderate

Drainage Class Well drained

Max Erosion Hazard High

Seedling Mortality Severe to moderate

Revegetating Exposed Subsoil Slight

Soil Productivity
Forest Survey Site Class 3,4 P, WF
Annual Forage (lbs/acre) 50 to 240

Soil Manageability
Group II
Class 2p

Inclusions Included in this unit are small areas of Cohasset, Crozier, and Ledmount soils. Included soils make up about 15 percent of the total area.

Management Considerations Kinkel Variant soils have a high amount of rock fragments. Concentrated surface runoff from Rock outcrop areas can increase erosion on adjacent soils. Rock outcrop areas are a potential source of aggregate.

KME Kyburz-Aldi complex, 2 to 30 percent slopes

Elevation: 5,500 to 6,400 feet Annual Precipitation: 18 to 35 inches

Typical Vegetation Mixed conifer-Sagebrush series.

Soil Map Unit Components	Kyburz	Aldi
Proportion (percent)	65	25

Soil Profile Description

Surface Layer	0 to 6 inches; brown gravelly sandy loam; moderate granular structure; slightly acid.	0 to 8 inches; brown loam; weak granular structure; slightly acid.
Subsoil	6 to 34 inches; reddish brown gravelly clay loam; moderate subangular blocky structure; very strongly acid.	8 to 18 inches; brown clay loam; moderate angular blocky structure; neutral.
Substratum	34 inches; weathered andesitic rock.	18 inches; weathered andesite.

Soil Properties & Management Interpretations

Effective Rooting Depth (inches)	20 to 40	10 to 20
Available Water Capacity Class	Low	Very low to low
AWC for top 20"	2.2-2.7	2.7-3.3
Permeability: Subsoil	Moderately slow	Slow
Substratum	Moderately slow	Very slow
Drainage Class	Well drained	Well drained
Max Erosion Hazard	High	High
Seedling Mortality	Slight	Slight
Revegetating Exposed Subsoil	Slight	Severe
Soil Productivity		
Forest Survey Site Class	5 P	Not capable
Annual Forage (lbs/acre)	120 to 190	120 to 190
Soil Manageability		
Group	II	II
Class	2ep	2e

Inclusions Included in this unit are small areas of Franktown and Trojan soils; soils similar to Franktown and Aldi but with a paralithic contract; and shallow soils with a fine-loamy argillic horizon. Included areas make up about 10 percent of the total area.

Management Considerations Relatively short growing season. Kyburz soils are moderately deep and have a thin surface layer. Aldi soils are shallow to hard bedrock and they have very low subsoil strength when wet. The subsoil tends to perch water during the spring, they reach field capacity rapidly, and can produce surface runoff.

KMF Kyburz-Aldi complex, 30 to 50 percent slopes

Elevation: 5,500 to 6,400 feet Annual Precipitation: 18 to 35 inches

Typical Vegetation Mixed conifer-Sagebrush series.

Soil Map Unit Components	Kyburz	Aldi
Proportion (percent)	65	25

Soil Profile Description

Surface Layer	0 to 6 inches; brown gravelly sandy loam; moderate granular structure; slightly acid.	0 to 8 inches; brown loam; weak granular structure; slightly acid.
Subsoil	6 to 34 inches; reddish brown gravelly clay loam; moderate subangular blocky structure; very strongly acid.	8 to 18 inches; brown clay loam; moderate angular blocky structure; neutral.
Substratum	34 inches; weathered andesitic rock.	18 inches; weathered andesite.

Soil Properties & Management Interpretations

Effective Rooting Depth (inches)	20 to 40	10 to 20
Available Water Capacity Class	Low	Very low to low
AWC for top 20"	2.2-2.7	2.7-3.3
Permeability: Subsoil	Moderately slow	Slow
Substratum	Moderately slow	Very slow
Drainage Class	Well drained	Well drained
Max Erosion Hazard	High	Very high
Seedling Mortality	Slight	Slight
Revegetating Exposed Subsoil	Slight	Severe
Soil Productivity Forest Survey Site Class	5 P	Not capable
Annual Forage (lbs/acre)	120 to 190	120 to 190
Soil Manageability Group	III	III
Class	3Ep	3E

Inclusions Included in this unit are small areas of Franktown and Trojan soils; soils similar to Franktown and Aldi but with a paralithic contact above 20 inches; and shallow soils with fine-loamy argillic horizons. Included areas make up about 10 percent of the total area.

Management Considerations Steep slopes. Relatively short growing season. Kyburz soils are moderately deep and have a thin surface layer. Aldi soils are shallow to hard bedrock and have very low subsoil strength when wet. The subsoil tends to perch water during the spring, and these soils reach field capacity rapidly and can produce surface runoff.



KMF2 Kyburz-Aldi complex, 30 to 50 percent slopes, eroded

Elevation: 5,500 to 6,400 feet Annual Precipitation: 18 to 35 inches

Typical Vegetation

Mixed conifer-Sagebrush series.

Soil Map Unit Components

Kyburz, eroded

Aldi, eroded

Proportion (percent)

65

25

Soil Profile Description

Surface Layer

0 to 4 inches; brown loam; moderate granular structure; slightly acid.

0 to 2 inches; grayish brown gravelly loam; massive; neutral.

Subsoil

4 to 23 inches; brown cobbly loam; moderate subangular blocky structure; medium acid.

2 to 18 inches; brown clay loam; moderate subangular blocky structure; slightly acid.

Substratum

23 inches; weathered volcanic rock (andesitic flow rock or tuff breccia).

18 inches; hard to slightly weathered volcanic rock.

Soil Properties & Management Interpretations

Effective Rooting Depth (inches)

20 to 40

10 to 20

Available Water Capacity Class

Low

Very low

AWC for top 20"

2.4-3.1

2.2-2.6

Permeability: Subsoil
Substratum

Moderately slow
Moderately slow

Slow
Very slow

Drainage Class

Well drained

Well drained

Max Erosion Hazard

High

Very high

Seedling Mortality

Slight

Slight to moderate

Revegetating Exposed Subsoil

Moderate

Severe

Soil Productivity

Forest Survey Site Class
Annual Forage (lbs/acre)

6 P, WF
Not rated

Not capable
Not rated

Soil Manageability

Group
Class

IV
4Ep

IV
4E

Inclusions

Included in this unit are small areas of Franktown and Trojan soils, Rock outcrop, and shallow soils with a fine-loamy argillic horizon. Included areas make up about 10 percent of the total area.

Management Considerations

Steep slopes and a relatively short growing season. Surface soils have been eroded. On-site investigations are necessary to determine if corrective treatment is needed. Kyburz soils are moderately deep and have a thin surface layer. Aldi soils are shallow to hard bedrock and have very low subsoil strength when wet. The subsoil tends to perch water during the spring, and these soils reach field capacity rapidly and can produce surface runoff.

KPC Aldi-Aquolls-Kyburz complex, 2 to 9 percent slopes

Elevation: 5,500 to 6,400 feet Annual Precipitation: 20 to 30 inches

Typical Vegetation

Sagebrush/Bitterbrush-Meadow/Willow series; Mixed conifer series.

Soil Map Unit
Components

Aldi

Aquolls

Kyburz

Proportion (percent)

50

20

15

Soil Profile Description

Surface Layer

0 to 8 inches; brown loam; weak granular structure; slightly acid.

Thick and dark colored; stratified coarse sand to clay.

0 to 6 inches; brown gravelly sandy loam; moderate granular structure; slightly acid.

Subsoil

8 to 18 inches; brown clay loam; moderate angular blocky structure; neutral.

Stratified layers with mottles; sandy loam to clay; some are very gravelly.

6 to 34 inches; reddish brown gravelly clay loam; moderate subangular blocky structure; very strongly acid.

Substratum

18 inches; weathered andesite.

Stratified alluvium.

34 inches; weathered andesitic rock.

Soil Properties & Management Interpretations

Effective Rooting
Depth (inches)

10 to 20

10 to 30

20 to 40

Available Water
Capacity Class

Very low to low

Variable

Low

AWC for top 20"

2.7-3.3

2.2-2.7

Permeability: Subsoil
Substratum

Slow
Very slow

Variable
Slow to very slow

Moderately slow
Moderately slow

Drainage Class

Well drained

Very poorly drained

Well drained

Max Erosion Hazard

High

High

High

Seedling Mortality

Slight

Severe

Slight

Revegetating Exposed
Subsoil

Severe

Severe

Severe

Soil Productivity

Forest Survey Site Class
Annual Forage (lbs/acre)

Not capable
120 to 190

Not capable
1,040 to 2,670

5,6 P
120 to 190

Soil Manageability

Group
Class

II
2e

II
4EW

II
2p

Inclusions

Included in this unit are small areas of Borolls, Franktown, and Sattley soils, and soils similar to Kyburz but with an umbric epipedon. Included areas make up about 15 percent of the total area.

Management
Considerations

Relatively short growing season. Aldi soils are shallow to hardbedrock and they have very low subsoil strength when wet. The subsoil tends to perch water during the spring, and they reach field capacity rapidly and can produce surface runoff. Aquolls have a high water table during most of the year, are susceptible to puddling, and are subject to flooding. Kyburz soils are moderately deep and have a thin surface layer.

KRE Kyburz-Rock outcrop-Trojan complex, 2 to 30 percent slopes

Elevation: 5,500 to 6,400 feet Annual Precipitation: 18 to 35 inches

Typical Vegetation Mixed conifer series.

Soil Map Unit
Components

Kyburz

Rock outcrop

Trojan

Proportion (percent)

55

20

15

Soil Profile Description

Surface Layer

0 to 6 inches; brown gravelly sandy loam; moderate granular structure; slightly acid.

Volcanic rock.

0 to 10 inches; dark brown gravelly sandy loam; weak platy structure; slightly acid.

Subsoil

6 to 34 inches; reddish brown gravelly clay loam; moderate subangular blocky structure; very strongly acid.

10 to 67 inches; brown and light brown clay loam; moderate angular blocky structure; medium acid.

Substratum

34 inches; weathered andesitic rock.

67 inches; slightly fractured andesite.

Soil Properties & Management Interpretations

Effective Rooting
Depth (inches)

20 to 40

40 to 80

Available Water
Capacity Class

Low

Low to moderate

AWC for top 20"

2.2-2.7

1.8-2.5

Permeability: Subsoil
Substratum

Moderately slow

Moderately slow

Moderately slow

Moderately slow

Drainage Class

Well drained

Well drained

Max Erosion Hazard

High

High

Seedling Mortality

Slight

Moderate to slight

Revegetating Exposed
Subsoil

Slight

Slight

Soil Productivity

Forest Survey Site Class
Annual Forage (lbs/acre)

5,6 P, WF
120 to 190

4,5 P, WF
190 to 240

Soil Manageability

Group
Class

II
2ep

II
2ep

Inclusions

Included in this unit are small areas of shallow soils with fine-loamy or clayey argillic horizons. Included areas make up about 10 percent of the total area.

Management
Considerations

Relatively short growing season. Kyburz soils are moderately deep and have a thin surface layer. Concentrated surface runoff from areas of Rock outcrop can increase erosion on adjacent soils. Rock outcrop areas are a potential source of aggregate.

KRF Kyburz-Rock outcrop-Trojan complex, 30 to 50 percent slopes

Elevation: 5,500 to 6,400 feet Annual Precipitation: 18 to 35 inches

Typical Vegetation Mixed conifer series.

Soil Map Unit
Components

Kyburz

Rock outcrop

Trojan

Proportion (percent)

50

25

15

Soil Profile Description

Surface Layer

0 to 6 inches; brown gravelly sandy loam; moderate granular structure; slightly acid.

Volcanic rock.

0 to 10 inches; dark brown gravelly sandy loam; weak platy structure; slightly acid.

Subsoil

6 to 34 inches; reddish brown gravelly clay loam; moderate subangular blocky structure; very strongly acid.

10 to 67 inches; brown and light brown clay loam; moderate angular blocky structure; medium acid.

Substratum

34 inches; weathered andesitic rock.

67 inches; slightly fractured andesite.

Soil Properties & Management Interpretations

Effective Rooting
Depth (inches)

20 to 40

40 to 80

Available Water
Capacity Class

Low

Low to moderate

AWC for top 20"

2.2-2.7

1.8-2.5

Permeability: Subsoil
 Substratum

Moderately slow

Moderately slow

Moderately slow

Moderately slow

Drainage Class

Well drained

Well drained

Max Erosion Hazard

High

High

Seedling Mortality

Slight

Moderate to slight

Revegetating Exposed
Subsoil

Slight

Slight

Soil Productivity

Forest Survey Site Class
Annual Forage (lbs/acre)

5,6 P, WF
120 to 190

4,5 P, WF
190 to 240

Soil Manageability

Group
Class

III
3Ep

III
3Ep

Inclusions

Included in this unit are small areas of Sattley soils and shallow soils with fine-loamy argillic horizons. Included areas make up about 10 percent of the total area.

Management
Considerations

Steep slopes. Relatively short growing season. Kyburz soils are moderately deep and have a thin surface layer. Concentrated surface runoff from areas of Rock outcrop can increase erosion on adjacent soils. Rock outcrop areas are a potential source of aggregate.

KRF2 Kyburz-Rock outcrop-Trojan complex, 30 to 50 percent slopes, eroded

Elevation: 5,500 to 6,400 feet Annual Precipitation: 18 to 35 inches

Typical Vegetation

Mixed conifer series.

Soil Map Unit Components

Kyburz, eroded

Rock outcrop

Trojan, eroded

Proportion (percent)

50

25

15

Soil Profile Description

Surface Layer

0 to 4 inches; brown loam; moderate granular structure; slightly acid.

Volcanic rock.

0 to 5 inches; brown sandy loam; weak granular structure; slightly acid.

Subsoil

4 to 23 inches; brown cobbly loam; moderate subangular blocky structure; medium acid.

5 to 48 inches; reddish brown gravelly clay loam; moderate subangular blocky structure; strongly acid.

Substratum

23 inches; weathered volcanic rock (andesitic flow rock or tuff breccia).

48 inches; weathered volcanic rock.

Soil Properties & Management Interpretations

Effective Rooting Depth (inches)

20 to 40

40 to 80

Available Water Capacity Class

Low

Low to moderate

AWC for top 20"

2.4-3.1

2.0-2.6

Permeability: Subsoil
Substratum

Moderately slow
Moderately slow

Moderately slow
Moderately slow

Drainage Class

Well drained

Well drained

Max Erosion Hazard

High

High

Seedling Mortality

Slight

Moderate

Revegetating Exposed Subsoil

Moderate

Slight

Soil Productivity

Forest Survey Site Class
Annual Forage (lbs/acre)

6 P, WF
Not rated

5 P, WF
Not rated

Soil Manageability

Group
Class

IV
4Ep

IV
4Ep

Inclusions

Included in this unit are small areas of Sattley soils and shallow soils with a fine-loamy argillic horizon. Included areas make up about 10 percent of the total area.

Management Considerations

Steep slopes and a relatively short growing season. Surface soils have been eroded. On-site investigations are necessary to determine if corrective treatment is needed. Kyburz soils are moderately deep and have a thin surface layer. Concentrated surface runoff from areas of Rock outcrop can increase erosion on adjacent soils. Rock outcrop areas are a potential source of aggregate.

KRG Aldi-Kyburz-Rock outcrop complex, 30 to 75 percent slopes

Elevation: 5,500 to 6,400 feet Annual Precipitation: 20 to 30 inches

Typical Vegetation Sagebrush/Bitterbrush-Mixed conifer series.

Soil Map Unit Components	Aldi	Kyburz	Rock outcrop
Proportion (percent)	30	20	15

Soil Profile Description

Surface Layer	0 to 8 inches; brown loam; weak granular structure; slightly acid.	0 to 6 inches; brown gravelly sandy loam; moderate granular structure; slightly acid.	Volcanic rock.
Subsoil	8 to 18 inches; brown clay loam; moderate angular blocky structure; neutral.	6 to 34 inches; reddish brown gravelly clay loam; moderate subangular blocky structure; very strongly acid.	
Substratum	18 inches; weathered andesite.	34 inches; weathered andesitic rock.	

Soil Properties & Management Interpretations

Effective Rooting Depth (inches)	10 to 20	20 to 40
Available Water Capacity Class	Very low to low	Low
AWC for top 20"	2.7-3.3	2.2-2.7
Permeability: Subsoil	Slow	Moderately slow
Substratum	Very slow	Moderately slow
Drainage Class	Well drained	Well drained
Max Erosion Hazard	Very high	High
Seedling Mortality	Slight	Slight
Revegetating Exposed Subsoil	Severe	Severe
Soil Productivity		
Forest Survey Site Class	Not capable	5,6 P
Annual Forage (lbs/acre)	120 to 190	120 to 190
Soil Manageability		
Group	IV	IV
Class	4E	4Ep

Inclusions Included in this unit are small areas of Franktown, Sattley, and Trojan soils; soils similar to Aldi but with a paralithic contact; soils similar to Kyburz but with a mollic epipedon; and shallow soils with a fine-loamy argillic horizon. Included areas make up about 35 percent of the total area.

Management Considerations Steep and very steep slopes. Relatively short growing season. Aldi soils are shallow to hard bedrock and have very low subsoil strength when wet. The subsoil tends to perch water in the spring, and they reach field capacity rapidly and can produce surface runoff. Kyburz soils are moderately deep and have a thin surface layer. Concentrated surface runoff from areas of Rock outcrop can increase erosion on adjacent soils. Rock outcrop areas are a potential source of aggregate.

KRG2 Aldi-Kyburz-Rock outcrop complex, 30 to 75 percent slopes, eroded

Elevation: 5,500 to 6,400 feet Annual Precipitation: 20 to 30 inches

Typical Vegetation Sagebrush/Bitterbrush-Mixed conifer series.

Soil Map Unit Components	Aldi, eroded	Kyburz, eroded	Rock outcrop
Proportion (percent)	30	20	15

Soil Profile Description

Soil Profile Description	Aldi, eroded	Kyburz, eroded	Rock outcrop
Surface Layer	0 to 2 inches; grayish brown gravelly loam; massive; neutral.	0 to 4 inches; brown loam; moderate granular structure; slightly acid.	Volcanic rock.
Subsoil	2 to 18 inches; brown clay loam; moderate subangular blocky structure; slightly acid.	4 to 23 inches; brown cobbly loam; moderate subangular blocky structure; medium acid.	
Substratum	18 inches; hard to slightly weathered volcanic rock.	23 inches; weathered volcanic rock (andesitic flow rock or tuff breccia).	

Soil Properties & Management Interpretations

Effective Rooting Depth (inches)	10 to 20	20 to 40
Available Water Capacity Class	Very low	Low
AWC for top 20"	2.2-2.6	2.4-3.1
Permeability: Subsoil	Slow	Moderately slow
Substratum	Very slow	Moderately slow
Drainage Class	Well drained	Well drained
Max Erosion Hazard	Very high	High
Seedling Mortality	Slight to moderate	Slight
Revegetating Exposed Subsoil	Moderate	Severe
Soil Productivity		
Forest Survey Site Class	Not capable	6 P
Annual Forage (lbs/acre)	Not rated	Not rated
Soil Manageability		
Group	IV	IV
Class	4E	4Ep
Inclusions	Included in this unit are small areas of Franktown, Sattley, and Trojan soils, and shallow soils with a fine-loamy agrillic horizon. Included areas make up about 35 percent of the total area.	
Management Considerations	Steep and very steep slopes. Relatively short growing season. Surface soils have been eroded. On-site investigations are necessary to determine if corrective treatment is needed. Aldi soils are shallow to hard bedrock and have very low subsoil strength when wet. The subsoil tends to perch water during the spring, and they reach field capacity rapidly and can produce surface runoff. Kyburz soils are moderately deep and have a thin surface layer. Concentrated surface runoff from areas of Rock outcrop can increase the erosion of adjacent soils. Rock outcrop areas are a potential source of aggregate.	

KVE Kyburz-Trojan-Aquolls complex, 2 to 30 percent slopes

Elevation: 5,500 to 6,400 feet Annual Precipitation: 18 to 40 inches

Typical Vegetation

Mixed conifer-Alder/Willow series; Meadow/Willow series.

Soil Map Unit Components

Kyburz

Trojan

Aquolls

Proportion (percent)

45

25

15

Soil Profile Description

Surface Layer

0 to 6 inches; brown gravelly sandy loam; moderate granular structure; slightly acid.

0 to 10 inches; dark brown gravelly sandy loam; weak platy structure; slightly acid.

Thick and dark colored; stratified coarse sand to clay.

Subsoil

6 to 34 inches; reddish brown gravelly clay loam; moderate subangular blocky structure; very strongly acid.

10 to 67 inches; brown and light brown clay loam; moderate angular blocky structure; medium acid.

Stratified layers with mottles; sandy loam to clay; some are very gravelly.

Substratum

34 inches; weathered andesitic rock.

67 inches; slightly fractured andesite.

Stratified alluvium.

Soil Properties & Management Interpretations

Effective Rooting Depth (inches)

20 to 40

40 to 80

10 to 30

Available Water Capacity Class

Low

Low to moderate

Variable

AWC for top 20"

2.2-2.7

1.8-2.5

Permeability: Subsoil
Substratum

Moderately slow
Moderately slow

Moderately slow
Moderately slow

Variable
Slow to very slow

Drainage Class

Well drained

Well drained

Very poorly drained

Max Erosion Hazard

High

High

High

Seedling Mortality

Slight

Moderate to slight

Severe

Revegetating Exposed Subsoil

Slight

Slight

Severe

Soil Productivity

Forest Survey Site Class
Annual Forage (lbs/acre)

5,6 P, WF
120 to 190

4,5 P, WF
190 to 240

Not capable
1,040 to 2,670

Soil Manageability

Group
Class

II
2ep

II
2e

II
4EW

Inclusions

Included in this unit are small areas of Aldi, Jorge, Kyburz, Sierraville, and Waca soils; Borolls; and deep very gravelly alluvial soils. Included areas make up about 15 percent of the total area.

Management Considerations

Relatively short growing season. Kyburz soils are moderately deep and have a thin surface layer. Aquolls have a high water table during most of the year, are susceptible to puddling, and are subject to flooding.

LCE Ledford-Ledford Variant complex, 2 to 30 percent slopes

Elevation: 5,000 to 9,000 feet Annual Precipitation: 50 to 70 inches

Typical Vegetation Mixed conifer series.

Soil Map Unit
Components

Ledford

Ledford Variant

Proportion (percent)

45

40

Soil Profile Description

Surface Layer

0 to 15 inches; brown sandy loam; weak granular structure; slightly acid.

0 to 7 inches; dark grayish brown fine sandy loam; moderate granular structure; slightly acid.

Subsoil

15 to 56 inches; pale brown very gravelly coarse sandy loam; massive; medium acid.

7 to 28 inches; yellowish brown gravelly sandy loam; weak subangular blocky structure; medium acid.

Substratum

56 inches; highly weathered granitic rock.

28 inches; weathered granitic rock.

Soil Properties & Management Interpretations

Effective Rooting
Depth (inches)

40 to 60

20 to 40

Available Water
Capacity Class

Very low to low

Very low

AWC for top 20"

1.4-2.2

1.3-2.1

Permeability: Subsoil
 Substratum

Rapid
Slow

Rapid
Slow

Drainage Class

Excessively drained

Excessively drained

Max Erosion Hazard

High

High

Seedling Mortality

Moderate to slight

Moderate to slight

Revegetating Exposed
Subsoil

Slight

Slight

Soil Productivity

Forest Survey Site Class
Annual Forage (lbs/acre)

3 RF, WF
140 to 180

4 RF, WF
100 to 140

Soil Manageability

Group
Class

III
3Ep

III
3Ep

Inclusions

Included in this unit are small areas of Rock outcrop; similar soils with thin light colored surface layers; and similar soils with more than 35 percent rock fragments. Included areas make up about 15 percent of the total area.

Management
Considerations

Coarse textures and a relatively low cation exchange capacity. Ledford Variant soils are moderately deep and have a thin surface layer.

LCF Ledford-Ledford Variant complex, 30 to 50 percent slopes

Elevation: 5,000 to 9,000 feet Annual Precipitation: 50 to 70 inches

Typical Vegetation Mixed conifer series; Red fir series.

Soil Map Unit Components	Ledford	Ledford Variant
Proportion (percent)	45	40

Soil Profile Description

Surface Layer	0 to 15 inches; brown sandy loam; weak granular structure; slightly acid.	0 to 7 inches; dark grayish brown fine sandy loam; moderate granular structure; slightly acid.
Subsoil	15 to 56 inches; pale brown very gravelly coarse sandy loam; massive; medium acid.	7 to 28 inches; yellowish brown gravelly sandy loam; weak subangular blocky structure; medium acid.
Substratum	56 inches; highly weathered granitic rock.	28 inches; weathered granitic rock.

Soil Properties & Management Interpretations

Effective Rooting Depth (inches)	40 to 60	20 to 40
Available Water Capacity Class	Very low to low	Very low
AWC for top 20"	1.4-2.2	1.3-2.1
Permeability: Subsoil	Rapid	Rapid
Substratum	Slow	Slow
Drainage Class	Excessively drained	Excessively drained
Max Erosion Hazard	High	High
Seedling Mortality	Moderate to slight	Moderate to slight
Revegetating Exposed Subsoil	Slight	Slight
Soil Productivity		
Forest Survey Site Class	3 RF, WF	4 RF, WF
Annual Forage (lbs/acre)	140 to 180	100 to 140
Soil Manageability		
Group	III	III
Class	3Ep	3Ep

Inclusions Included in this unit are small areas of Rock outcrop; similar soils with a thin light colored surface layer; and similar soils with more than 35 percent rock fragments. Included areas make up about 15 percent of the total area.

Management Considerations Steep slopes. Coarse textures and a relatively low cation exchange capacity. Ledford Variant soils are moderately deep and have a thin surface layer.

LDE Ledford-Ledford Variant-Cryumbrepts, wet complex, 2 to 30 percent slopes

Elevation: 5,000 to 9,000 feet Annual Precipitation: 50 to 70 inches

Typical Vegetation Mixed conifer-Alder/Willow series; Red fir-Alder/Willow series.

Soil Map Unit Components	Ledford	Ledford Variant	Cryumbrepts, wet
Proportion (percent)	35	35	15

Soil Profile Description

Soil Profile Description	Ledford	Ledford Variant	Cryumbrepts, wet
Surface Layer	0 to 15 inches; brown sandy loam; weak granular structure; slightly acid.	0 to 7 inches; dark grayish brown fine sandy loam; moderate granular structure; slightly acid.	Thick and dark colored; stratified sandy loam, silt loam, and clay loam; gravelly, cobbly, or stony.
Subsoil	15 to 56 inches; pale brown very gravelly coarse sandy loam; massive; medium acid.	7 to 28 inches; yellowish brown gravelly sandy loam; weak subangular blocky structure; medium acid.	
Substratum	56 inches; highly weathered granitic rock.	28 inches; weathered granitic rock.	Stratified loam to clay loam with dark colored mottles; gravelly, cobbly, or stony.

Soil Properties & Management Interpretations

Effective Rooting Depth (inches)	40 to 60	20 to 40	Variable
Available Water Capacity Class	Very low to low	Very low	Very low
AWC for top 20"	1.4-2.2	1.3-2.1	
Permeability: Subsoil Substratum	Rapid Slow	Rapid Slow	Moderately rapid Very slow
Drainage Class	Excessively drained	Excessively drained	Poorly drained
Max Erosion Hazard	High	High	Very high
Seedling Mortality	Moderate to slight	Moderate to slight	Severe
Revegetating Exposed Subsoil	Slight	Slight	Severe
Soil Productivity Forest Survey Site Class Annual Forage (lbs/acre)	2,3 RF, WF 140 to 220	4 RF, WF 100 to 140	Not capable 170 to 640
Soil Manageability Group Class	III 3Ep	III 3Ep	III 4EW
Inclusions	Included in this unit are small areas of Rock outcrop; similar soils with a thin light colored surface layer; similar soils with more than 35 percent rock fragments; and similar soils with a cambic horizon. Included areas make up about 15 percent of the total area.		
Management Considerations	Ledford and Ledford Variant soils have coarse textures and a relatively low cation exchange capacity. Ledford Variant soils are moderately deep and have a thin surface layer. Cryumbrepts, wet have a high water table most of the year, are susceptible to puddling, and often have impermeable layers between 1 and 2 feet.		

LDF Ledford-Ledford Variant-Cryumbrepts, wet complex, 30 to 50 percent slopes

Elevation: 5,000 to 9,000 feet Annual Precipitation: 50 to 70 inches

Typical Vegetation

Mixed conifer-Alder/Willow series; Red fir-Alder/Willow series.

Soil Map Unit
Components

Ledford

Ledford Variant

Cryumbrepts, wet

Proportion (percent)

35

35

15

Soil Profile Description

Surface Layer

0 to 15 inches; brown sandy loam; weak granular structure; slightly acid.

0 to 7 inches; dark grayish brown fine sandy loam; moderate granular structure; slightly acid.

Thick and dark colored; stratified sandy loam, silt loam, and clay loam; gravelly, cobbly, or stony.

Subsoil

15 to 56 inches; pale brown very gravelly coarse sandy loam; massive; medium acid.

7 to 28 inches; yellowish brown gravelly sandy loam; weak subangular blocky structure; medium acid.

Substratum

56 inches; highly weathered granitic rock.

28 inches; weathered granitic rock.

Stratified loam to clay loam with dark colored mottles; gravelly, cobbly, or stony.

Soil Properties & Management Interpretations

Effective Rooting
Depth (inches)

40 to 60

20 to 40

Variable

Available Water
Capacity Class

Very low to low

Very low

Very low

AWC for top 20"

1.4-2.2

1.3-2.1

Permeability: Subsoil
Substratum

Rapid
Slow

Rapid
Slow

Moderately rapid
Very slow

Drainage Class

Excessively drained

Edcessively drained

Poorly drained

Max Erosion Hazard

High

High

Very high

Seedling Mortality

Moderate to slight

Moderate to slight

Severe

Revegetating Exposed
Subsoil

Slight

Slight

Severe

Soil Productivity

Forest Survey Site Class
Annual Forage (lbs/acre)

2,3 RF, WF
140 to 220

4 RF, WF
100 to 140

Not capable
170 to 640

Soil Manageability

Group
Class

III
3Ep

III
3Ep

III
4EW

Inclusions

Included in this unit are small areas of Rock outcrop; soils similar to Ledford and Ledford Variant but with more than 35 percent rock fragments or ochric epipedons; soils similar to Ledford Variant but with dark colors in the A horizon extending below 20 inches; and similar soils with a cambic horizon. Included areas make up about 15 percent of the total area.

Management
Considerations

Steep slopes. Ledford and Ledford Variant soils have coarse textures and a relatively low cation exchange capacity. Ledford Variant soils are moderately deep and have a thin surface layer. Cryumbrepts, wet have a high water table most of the year, are susceptible to puddling, and often have impermeable layers between 1 and 2 feet.

LOE Lorack-Smokey-Cryumbrepts, wet complex, 2 to 30 percent slopes

Elevation: 5,500 to 7,000 feet Annual Precipitation: 65 to 75 inches

Typical Vegetation

Mixed conifer-Alder/Willow series; Red fir-Alder/Willow series.

Soil Map Unit Components

Lorack **Smokey** **Cryumbrepts, wet**

Proportion (percent)

55 20 15

Soil Profile Description

Surface Layer

0 to 8 inches; dark brown very gravelly fine sandy loam; weak granular structure; medium acid. 0 to 4 inches; brown gravelly sandy loam; moderate granular structure; strongly acid. Thick and dark colored; stratified sandy loam, silt loam, and clay loam; gravelly, cobbly, or stony.

Subsoil

8 to 56 inches; yellowish brown extremely gravelly loam; weak subangular blocky structure; strongly acid. 4 to 24 inches; light yellowish brown very gravelly loam; weak subangular blocky; very strongly acid.

Substratum

56 to 75 inches; extremely gravelly sandy loam; weakly cemented; extremely acid. 24 inches; weathered metasedimentary rock. Stratified loam to clay loam with dark colored mottles; gravelly, cobbly, or stony.

Soil Properties & Management Interpretations

Effective Rooting Depth (inches)

45 to 70 20 to 40 Variable

Available Water Capacity Class

Very low to low Very low Very low

AWC for top 20"

1.0-1.4 1.3-1.8

Permeability: Subsoil Substratum

Moderate Moderately slow Moderate Slow Moderately rapid Very slow

Drainage Class

Well drained Well drained Poorly drained

Max Erosion Hazard

High High Very high

Seedling Mortality

Severe Moderate Severe

Revegetating Exposed Subsoil

Moderate Moderate Severe

Soil Productivity

Forest Survey Site Class Annual Forage (lbs/acre)

2,3 RF, SP 140 to 220 4,5 RF, SP 100 to 140 Not capable 170 to 640

Soil Manageability

Group Class

II 2ep II 2ep II 4EW

Inclusions

Included in this unit are small areas of soils similar to Lorack but with a thick dark surface layer; moderately deep soils similar to Lorack; soils similar to Lorack but with less than 35 percent rock fragments and with redder colors; deep soils with less than 35 percent rock fragments; and soils formed from ultra-basic rock near Black Mountain. Included areas make up about 10 percent of the total area.

Management Considerations

Lorack soils have a high amount of rock fragments. Smokey soils are moderately deep, have a high amount of rock fragments, and have a thin surface layer. Cryumbrepts, wet have a high water table most of the year, are susceptible to puddling, and often have impermeable layers between 1 and 2 feet.

LOF Lorack-Smokey-Cryumbrepts, wet complex, 30 to 50 percent slopes

Elevation: 5,500 to 7,000 feet Annual Precipitation: 65 to 75 inches

Typical Vegetation

Mixed conifer-Alder/Willow series; Red fir-Alder/Willow series.

Soil Map Unit Components

Lorack

Smokey

Cryumbrepts, wet

Proportion (percent)

45

30

15

Soil Profile Description

Surface Layer

0 to 8 inches; dark brown very gravelly fine sandy loam; weak granular structure; medium acid.

0 to 4 inches; brown gravelly sandy loam; moderate granular structure; strongly acid.

Thick and dark colored; stratified sandy loam, silt loam, and clay loam; gravelly, cobbly, or stony.

Subsoil

8 to 56 inches; yellowish brown extremely gravelly loam; weak subangular blocky structure; strongly acid.

4 to 24 inches; light yellowish brown very gravelly loam; weak subangular blocky; very strongly acid.

Substratum

56 to 75 inches; extremely gravelly sandy loam; weakly cemented; extremely acid.

24 inches; weathered metasedimentary rock.

Stratified loam to clay loam with dark colored mottles; gravelly, cobbly, or stony.

Soil Properties & Management Interpretations

Effective Rooting Depth (inches)

45 to 70

20 to 40

Variable

Available Water Capacity Class

Very low to low

Very low

Very low

AWC for top 20"

1.0-1.4

1.3-1.8

Permeability: Subsoil Substratum

Moderate Moderately slow

Moderate Slow

Moderately rapid Very slow

Drainage Class

Well drained

Well drained

Poorly drained

Max Erosion Hazard

High

High

Very high

Seedling Mortality

Severe

Moderate

Severe

Revegetating Exposed Subsoil

Moderate

Moderate

Severe

Soil Productivity

Forest Survey Site Class Annual Forage (lbs/acre)

2,3 RF
140 to 220

4,5 RF
100 to 140

Not capable
170 to 640

Soil Manageability

Group Class

III
3Ep

III
3Ep

III
4EW

Inclusions

Included in this unit are small areas of soils similar to Lorack but with a thick dark surface layer; moderately deep soils similar to Lorack; soils similar to Lorack but with less than 35 percent rock fragments and with redder colors; deep soils with less than 35 percent rock fragments; and soils formed from ultra-basic rock near Black Mountain. Included areas make up about 10 percent of the total area.

Management Considerations

Steep slopes. Lorack soils have a high amount of rock fragments. Smokey soils are moderately deep, have a high amount of rock fragments, and have a thin surface layer. Cryumbrepts, wet have a high water table most of the year, are susceptible to puddling, and often have impermeable layers between 1 and 2 feet.

MAE Mariposa-Jocal complex, 2 to 30 percent slopes

Elevation: 2,000 to 4,000 feet Annual Precipitation: 50 to 65 inches

Typical Vegetation

Mixed conifer-Mixed hardwood series.

Soil Map Unit
Components

Mariposa

Jocal

Proportion (percent)

55

30

Soil Profile Description

Surface Layer

0 to 6 inches; dark brown gravelly loam; strong granular structure; neutral.

0 to 18 inches; reddish brown loam; weak granular structure; slightly acid.

Subsoil

6 to 33 inches; yellowish red gravelly clay loam; massive; strongly acid.

18 to 70 inches; reddish yellow silty clay loam; moderate angular blocky structure; strongly acid.

Substratum

33 inches; hard and semi-hard metasediments.

70 inches; weathered slate and shale.

Soil Properties & Management Interpretations

Effective Rooting
Depth (inches)

15 to 33

40 to 70

Available Water
Capacity Class

Low

Low to high

AWC for top 20"

2.2-2.8

2.4-3.1

Permeability: Subsoil
Substratum

Moderate
Moderately slow

Moderately slow
Moderately slow

Drainage Class

Well drained

Well drained

Max Erosion Hazard

High

Moderate

Seedling Mortality

Moderate to slight

Slight

Revegetating Exposed
Subsoil

Moderate

Slight

Soil Productivity

Forest Survey Site Class
Annual Forage (lbs/acre)

3,4 P, DF
120 to 170

1,2 P, DF
240 to 640

Soil Manageability

Group
Class

II
2ep

II
2e

Inclusions

Included in this unit are small areas of Hurlbut soils; metamorphic Rock outcrop; similar soils but with more than 35 percent rock fragments; colluvial soils similar to Jocal but with more than 35 percent rock fragments; and shallow soils with argillic horizons. Included areas make up about 15 percent of the total area.

Management
Considerations

Mariposa soils are shallow and moderately deep, and have a thin surface layer. They reach field capacity rapidly and can produce surface runoff.

MAE5 Mariposa-Jocal complex, 2 to 30 percent slopes, altered

Elevation: 2,000 to 4,000 feet Annual Precipitation: 50 to 65 inches

Typical Vegetation

Plantation.

Soil Map Unit
Components

Mariposa, altered

Jocal, altered

Proportion (percent)

55

30

Soil Profile Description

Surface Layer

0 to 6 inches; brown loam; weak granular structure; slightly acid.

0 to 9 inches; reddish brown loam; weak granular structure; slightly acid.

Subsoil

6 to 21 inches; reddish brown cobbly clay loam; weak angular blocky structure; medium acid.

9 to 50 inches; reddish brown gravelly clay loam; weak subangular blocky structure; medium acid.

Substratum

21 inches; weathered metasedimentary rock.

50 inches; weathered metasedimentary rock.

Soil Properties & Management Interpretations

Effective Rooting
Depth (inches)

15 to 33

40 to 70

Available Water
Capacity Class

Very low to low

Low to moderate

AWC for top 20"

2.7-3.2

2.2-3.0

Permeability: Subsoil
Substratum

Moderate

Moderately slow

Moderately slow

Moderately slow

Drainage Class

Well drained

Well drained

Max Erosion Hazard

High

High

Seedling Mortality

Slight to moderate

Slight to moderate

Revegetating Exposed
Subsoil

Moderate

Slight

Soil Productivity

Forest Survey Site Class
Annual Forage (lbs/acre)

Not rated

Not rated

Not rated

Not rated

Soil Manageability

Group
Class

IV
4ep

IV
4e

Inclusions

Included in this unit are small areas of Hurlbut and Sites soils, Rock outcrop, and areas where slopes are 30 to 50 percent. Included areas make up about 15 percent of the total area.

Management
Considerations

Surface soils have been disturbed. On-site investigations are needed to determine if corrective treatments are needed. Mariposa soils are shallow and moderately deep, and have a thin surface layer. They reach field capacity rapidly and can produce surface runoff.

MAG Mariposa-Jocal complex, 30 to 75 percent slopes

Elevation: 2,500 to 4,500 feet Annual Precipitation: 50 to 65 inches

Typical Vegetation

Hardwoods-Mixed conifer series; Mixed conifer-Black oak series.

Soil Map Unit Components

Mariposa

Jocal

Proportion (percent)

55

30

Soil Profile Description

Surface Layer

0 to 6 inches; dark brown gravelly loam; strong granular structure; neutral.

0 to 18 inches; reddish brown loam; weak granular structure; slightly acid.

Subsoil

6 to 33 inches; yellowish red gravelly clay loam; massive; strongly acid.

18 to 70 inches; reddish yellow silty clay loam; moderate angular blocky structure; strongly acid.

Substratum

33 inches; hard and semi-hard metasediments.

70 inches; weathered slate and shale.

Soil Properties & Management Interpretations

Effective Rooting Depth (inches)

15 to 33

40 to 70

Available Water Capacity Class

Low

Low to high

AWC for top 20"

2.2-2.8

2.4-3.1

Permeability: Subsoil Substratum

Moderate
Moderately slow

Moderately slow
Moderately slow

Drainage Class

Well drained

Well drained

Max Erosion Hazard

High

High

Seedling Mortality

Moderate to slight

Slight

Revegetating Exposed Subsoil

Severe

Slight

Soil Productivity

Forest Survey Site Class
Annual Forage (lbs/acre)

3,4 P, DF
120 to 170

1,2 DF, P
240 to 640

Soil Manageability

Group
Class

IV
4Ep

IV
4E

Inclusions

Included in this unit are small areas of Deadwood and Hurlbut soils; Rock outcrop; similar soils with more than 35 percent rock fragments; colluvial soils similar to Jocal with more than 35 percent rock fragments; and deep soils without argillic horizons. Included areas make up about 15 percent of the total area.

Management Considerations

Steep and very steep slopes. Mariposa soils are shallow and moderately deep, and have a thin surface layer. They reach field capacity rapidly and can produce surface runoff.

MCE McCarthy-Ledmount-Crozier complex, 2 to 30 percent slopes

Elevation: 2,000 to 5,500 feet Annual Precipitation: 55 to 70 inches

Typical Vegetation

Mixed conifer-Mixed Hardwood series; Mixed conifer-Mixed brush series.

Soil Map Unit Components

McCarthy **Ledmount** **Crozier**

Proportion (percent)

50 20 20

Soil Profile Description

Surface Layer

0 to 15 inches; brown gravelly sandy loam; moderate granular structure; slightly acid. 0 to 18 inches; dark grayish brown sandy loam; moderate granular structure; slightly acid. 0 to 15 inches; brown loam; moderate granular structure; slightly acid.

Subsoil

15 to 28 inches; brown very gravelly sandy loam; weak subangular blocky structure; slightly acid. 15 to 38 inches; yellowish red gravelly clay loam; weak subangular blocky structure; medium acid.

Substratum

28 inches; weathered andesitic tuff breccia. 18 inches; andesitic tuff breccia. 38 inches; weathered andesitic tuff breccia.

Soil Properties & Management Interpretations

Effective Rooting Depth (inches)

20 to 40 12 to 20 20 to 40

Available Water Capacity Class

Low Very low Low to moderate

AWC for top 20"

2.3-2.6 2.3-2.6 2.6-3.4

Permeability: Subsoil Substratum

Moderately rapid Moderately slow Moderately rapid Very slow Moderately slow Moderately slow

Drainage Class

Well drained Well drained Well drained

Max Erosion Hazard

High High Moderate

Seedling Mortality

Moderate Moderate Slight

Revegetating Exposed Subsoil

Slight Severe Slight

Soil Productivity

Forest Survey Site Class Annual Forage (lbs/acre)

4 DF, P 120 to 170 Not capable 20 to 80 2,3 DF, P 50 to 440

Soil Manageability

Group Class

II 2ep II 2ep II 2e

Inclusions

Included in this unit are small areas of Cohasset and Waca soils; Rock outcrop; soils similar to Crozier without argillic horizons; soils similar to McCarthy but with less than 35 percent rock fragments; soils similar to McCarthy but with an ochric epipedon; soils that are deeper and soils that have browner colors in the subsoil than McCarthy. Included areas make up about 10 percent of the total area.

Management Considerations

McCarthy soils are moderately deep and have a high amount of rock fragments. Ledmount soils are shallow to hard bedrock, they reach field capacity rapidly, and can produce surface runoff. Crozier soils are moderately deep.

MCE5 McCarthy-Ledmount-Crozier complex, 2 to 30 percent slopes, altered

Elevation: 2,000 to 5,500 feet Annual Precipitation: 55 to 70 inches

Typical Vegetation

Plantation.

Soil Map Unit Components

McCarthy, altered

Ledmount, altered

Crozier, altered

Proportion (percent)

50

20

20

Soil Profile Description

Surface Layer

0 to 10 inches; brown gravelly sandy loam; moderate granular structure; neutral.

0 to 11 inches; dark brown cobbly sandy loam; moderate granular structure; slightly acid.

0 to 3 inches; brown loam; massive; slightly acid.

Subsoil

10 to 28 inches; brown very cobbly loam; weak subangular blocky structure; neutral.

3 to 38 inches; yellowish red clay loam; weak subangular blocky structure; medium acid.

Substratum

28 inches; weathered tuff breccia.

11 inches; hard tuff breccia mudflow.

38 inches; weathered tuff breccia.

Soil Properties & Management Interpretations

Effective Rooting Depth (inches)

20 to 40

12 to 20

20 to 40

Available Water Capacity Class

Low

Very low

Low to moderate

AWC for top 20"

2.6-3.0

1.4-1.7

2.6-3.3

Permeability: Subsoil
Substratum

Moderately rapid
Moderately slow

Moderately rapid
Very slow

Moderately slow
Moderately slow

Drainage Class

Well drained

Well drained

Well drained

Max Erosion Hazard

High

High

High

Seedling Mortality

Moderate

Severe

Slight

Revegetating Exposed Subsoil

Slight

Moderate

Slight

Soil Productivity

Forest Survey Site Class
Annual Forage (lbs/acre)

Not rated
Not rated

Not rated
Not rated

Not rated
Not rated

Soil Manageability

Group
Class

IV
4ep

IV
4Ep

IV
4e

Inclusions

Included in this unit are small areas of Cohasset and Waca soils, and Rock outcrop. Included areas make up about 10 percent of the total area.

Management Considerations

Surface soils have been disturbed. On-site investigations are needed to determine if corrective treatments are needed. McCarthy soils are moderately deep and have a high amount of rock fragments. Ledmount soils are shallow to hard bedrock, they reach field capacity rapidly, and can produce surface runoff. Crozier soils are moderately deep.

MCG McCarthy-Ledmount-Crozier complex, 30 to 75 percent slopes

Elevation: 2,000 to 5,500 feet Annual Precipitation: 55 to 70 inches

Typical Vegetation

Mixed conifer-Mixed hardwood series; Mixed conifer-Mixed brush series.

Soil Map Unit Components

McCarthy

Ledmount

Crozier

Proportion (percent)

40

25

20

Soil Profile Description

Surface Layer

0 to 15 inches; brown gravelly sandy loam; moderate granular structure; slightly acid.

0 to 18 inches; dark grayish brown sandy loam; moderate granular structure; slightly acid.

0 to 15 inches; brown loam; moderate granular structure; slightly acid.

Subsoil

15 to 28 inches; brown very gravelly sandy loam; weak subangular blocky structure; slightly acid.

15 to 38 inches; yellowish red gravelly clay loam; weak subangular blocky structure; medium acid.

Substratum

28 inches; weathered andesitic tuff breccia.

18 inches; andesitic tuff breccia.

38 inches; weathered andesitic tuff breccia.

Soil Properties & Management Interpretations

Effective Rooting Depth (inches)

20 to 40

12 to 20

20 to 40

Available Water Capacity Class

Low

Very low

Low to moderate

AWC for top 20"

2.3-2.6

2.3-2.6

2.6-3.4

Permeability: Subsoil
Substratum

Moderately rapid
Moderately slow

Moderately rapid
Very slow

Moderately slow
Moderately slow

Drainage Class

Well drained

Well drained

Well drained

Max Erosion Hazard

High

High

High

Seedling Mortality

Moderate

Moderate

Slight

Revegetating Exposed Subsoil

Moderate

Severe

Slight

Soil Productivity

Forest Survey Site Class
Annual Forage (lbs/acre)

4 DF, P
120 to 170

Not capable
20 to 80

3,4 DF, P
50 to 440

Soil Manageability

Group
Class

IV
4Ep

IV
4Ep

IV
4E

Inclusions

Included in this unit are small areas of Cohasset, Meiss, and Waca soils; Rock outcrop; soils similar to McCarthy but with less than 35 percent rock fragments; soils similar to McCarthy but with an ochric epipedon; soils similar to McCarthy but are deeper or have browner colors in the subsoil; and deep fine-loamy soils with an umbric epipedon. Included areas make up about 15 percent of the total area.

Management Considerations

Steep and very steep slopes. McCarthy soils are moderately deep and have a high amount of rock fragments. Ledmount soils are shallow to hard bedrock. They reach field capacity rapidly and can produce surface runoff. Crozier soils are moderately deep.

MCG6 McCarthy-Ledmount-Crozier complex, 30 to 60 percent slopes, terraced

Elevation: 4,000 to 4,800 feet Annual Precipitation: 55 to 70 inches

Typical Vegetation

Mixed conifer-Mixed brush series; Mixed conifer-Mixed hardwood series.

Soil Map Unit Components

McCarthy, terraced **Ledmount, terraced** **Crozier, terraced**

Proportion (percent)

40 25 20

Soil Profile Description

Surface Layer

0 to 7 inches; grayish brown loam; moderate granular structure; slightly acid.

0 to 10 inches; grayish brown gravelly sandy loam; moderate granular structure; slightly acid.

0 to 6 inches; strong brown loam; moderate granular structure; slightly acid.

Subsoil

7 to 32 inches; brown very cobbly loam; massive; medium acid.

6 to 38 inches; red clay loam; weak subangular blocky structure; medium acid.

Substratum

32 inches; weathered tuff breccia mudflow.

10 inches; hard tuff breccia mudflow.

38 inches; weathered tuff breccia.

Soil Properties & Management Interpretations

Effective Rooting Depth (inches)

20 to 40

12 to 20

20 to 40

Available Water Capacity Class

Low

Very low

Low to moderate

AWC for top 20"

2.7-3.0

1.3-1.5

3.1-3.6

Permeability: Subsoil Substratum

Moderately rapid
Moderately slow

Moderately rapid
Very slow

Moderately slow
Moderately slow

Drainage Class

Well drained

Well drained

Well drained

Max Erosion Hazard

High

High

High

Seedling Mortality

Moderate

Severe

Slight

Revegetating Exposed Subsoil

Slight

Severe

Slight

Soil Productivity

Forest Survey Site Class Annual Forage (lbs/acre)

Not rated
Not rated

Not rated
Not rated

Not rated
Not rated

Soil Manageability

Group Class

IV
4Ep

IV
4Ep

IV
4E

Inclusions

Included in this unit are small areas of Cohasset soils and Rock outcrop. Included areas make up about 15 percent of the total area.

Management Considerations

Steep and very steep slopes. These areas have been terraced. On-site investigations are necessary to determine if corrective treatment is needed. McCarthy soils are moderately deep and have a high amount of rock fragments. Ledmount soils are shallow to hard bedrock. They reach field capacity rapidly and can produce surface runoff. Crozier soils are moderately deep.

MEB Martis-Euer Variant complex, 2 to 5 percent slopes

Elevation: 5,500 to 6,000 feet Annual Precipitation: 25 to 35 inches

Typical Vegetation

Sagebrush/Bitterbrush-Jeffrey/Ponderosa series; Sagebrush/Bitterbrush series.

Soil Map Unit
Components

Martis

Euer Variant

Proportion (percent)

60

25

Soil Profile Description

Surface Layer

0 to 17 inches; dark brown sandy loam; moderate granular structure; strongly acid.

0 to 12 inches; grayish brown gravelly sandy loam; moderately platy structure; slightly acid.

Subsoil

17 to 67 inches; brown gravelly sandy clay loam; massive; medium acid.

12 to 70 inches; pale brown very gravelly clay loam; weak subangular blocky structure; strongly acid.

Substratum

Soil Properties & Management Interpretations

Effective Rooting
Depth (inches)

40 to 70

40 to 70

Available Water
Capacity Class

Low to moderate

Low

AWC for top 20"

1.7-2.4

2.0-2.6

Permeability: Subsoil
Substratum

Moderately slow
Rapid

Moderately slow
Rapid

Drainage Class

Well drained

Well drained

Max Erosion Hazard

Moderate

Moderate

Seedling Mortality

Moderate to slight

Slight

Revegetating Exposed
Subsoil

Slight

Moderate

Soil Productivity

Forest Survey Site Class
Annual Forage (lbs/acre)

Not capable
120 to 190

5,4 P
120to 190

Soil Manageability

Group
Class

II
2p

II
2p

Inclusions

Included in this unit are small areas of Euer, Kyburz, and Martis Variant soils; Aquolls with dense substrata within 2 feet; similar soils but with ochric epipedons; soils similar to Martis but without a clay increase in the subsoil, or which are less than 40 inches deep. Included areas make up about 15 percent of the total area.

Management
Considerations

Short growing season. Martis soils are moderately deep to a root limiting, dense subsoil; are susceptible to puddling in the spring, and have a coarse textured surface layer. The substratum of Euer Variant soil is a potential source of gravel.

MHG Meiss-Gullied land-Rock outcrop complex, 30 to 75 percent slopes

Elevation: 6,000 to 10,000 feet Annual Precipitation: 50 to 80 inches

Typical Vegetation

Wyethia series.

Soil Map Unit Components

Meiss

Gullied land

Rock outcrop

Proportion (percent)

45

20

20

Soil Profile Description

Surface Layer

0 to 19 inches; brown sandy loam; moderate granular structure; neutral.

A network of moderately deep to deep V-shaped channels. Many have eroded down to bedrock. Erosion may be active.

Merhten mudflow exposures.

Subsoil

Substratum

19 inches; hard volcanic rock.

Soil Properties & Management Interpretations

Effective Rooting Depth (inches)

12 to 20

Available Water Capacity Class

Very low

AWC for top 20"

2.6-2.9

Permeability: Subsoil
Substratum

Moderately rapid
Very slow

Drainage Class

Somewhat excessively drained

Max Erosion Hazard

High

Seedling Mortality

Slight

Revegetating Exposed Subsoil

Severe

Soil Productivity

Forest Survey Site Class
Annual Forage (lbs/acre)

Not capable
60 to 160

Soil Manageability

Group
Class

IV
4Ed

Inclusions

Included in this unit are small areas of Waca soils; some Cryumbrepts, wet may be located in gullies; alluvial fans may be present at the bottom of gullies; and soils similar to Meiss but with 35 to 45 percent rock fragments. Included areas make up about 15 percent of the total area.

Management Considerations

Steep and very steep slopes. These lands need on-site investigations to determine if restoration is needed. Meiss soils are shallow to hard bedrock. They reach field capacity rapidly and can produce surface runoff. Gullied land and Rock outcrop areas produce concentrated runoff than can increase erosion on adjacent soils.

MIE Meiss-Rock outcrop complex, 2 to 30 percent slopes

Elevation: 6,000 to 10,000 feet Annual Precipitation: 50 to 80 inches

Typical Vegetation Wyethia series.

Soil Map Unit Components **Meiss** **Rock outcrop**

Proportion (percent) 70 15

Soil Profile Description

Surface Layer 0 to 19 inches; brown sandy loam; moderate granular structure; neutral. Merhten mudflow exposures.

Subsoil

Substratum 19 inches; hard volcanic rock.

Soil Properties & Management Interpretations

Effective Rooting Depth (inches) 12 to 20

Available Water Capacity Class Very low

AWC for top 20" 2.6-2.9

Permeability: Subsoil Moderately rapid
Substratum Very slow

Drainage Class Somewhat excessively drained

Max Erosion Hazard High

Seedling Mortality Slight

Revegetating Exposed Subsoil Severe

Soil Productivity
Forest Survey Site Class Not capable
Annual Forage (lbs/acre) 60 to 160

Soil Manageability
Group II
Class 2ed

Inclusions Included in this unit are small areas of Waca soils; soils similar to Meiss over basic rocks with 35 to 75 percent rock fragments; soils similar to Meiss but with loamy sand textures; and shallow soils without a lithic contact. Included areas make up about 15 percent of the total area.

Management Considerations Meiss soils are shallow to hard bedrock. They reach field capacity rapidly and can produce surface runoff. Concentrated surface runoff from Rock outcrop areas can increase erosion on adjacent soils.

MIG Meiss-Rock outcrop complex, 30 to 75 percent slopes

Elevation: 6,000 to 10,000 feet Annual Precipitation: 50 to 80 inches

Typical Vegetation Wyethia series.

Soil Map Unit Components **Meiss** **Rock outcrop**

Proportion (percent) 60 25

Soil Profile Description

Surface Layer 0 to 19 inches; brown sandy loam; moderate granular structure; neutral. Merhten mudflow exposures.

Subsoil

Substratum 19 inches; hard volcanic rock.

Soil Properties & Management Interpretations

Effective Rooting Depth (inches) 12 to 20

Available Water Capacity Class Very low

AWC for top 20" 2.6-2.9

Permeability: Subsoil Moderately rapid
Substratum Very slow

Drainage Class Somewhat excessively drained

Max Erosion Hazard High

Seedling Mortality Slight

Revegetating Exposed Subsoil Severe

Soil Productivity

Forest Survey Site Class Not capable
Annual Forage (lbs/acre) 60 to 160

Soil Manageability

Group IV
Class 4Ed

Inclusions

Included in this unit are small areas of Waca soils; soils similar to Meiss with 35 to 75 percent rock fragments; soils similar to Meiss but with loamy sand textures; and very shallow soils. Included areas make up about 15 percent of the total area.

Management Considerations

Steep and very steep slopes. Meiss soils are shallow to hard bedrock. They reach field capacity rapidly and are capable of producing surface runoff. Concentrated surface runoff from areas of Rock outcrop can increase erosion on adjacent soils.

MIG3 Meiss-Rock outcrop complex, 30 to 75 percent slopes, severely eroded

Elevation: 6,500 to 9,000 feet Annual Precipitation: 50 to 80 inches

Typical Vegetation	Wyethia series.	
Soil Map Unit Components	Meiss, severely eroded	Rock outcrop
Proportion (percent)	60	25

Soil Profile Description

Surface Layer	0 to 2 inches; grayish brown gravelly loamy sand; single grain structure; slightly acid.	Merhten mudflow exposures.
Subsoil	2 to 11 inches; brown gravelly sandy loam; massive; slightly acid.	
Substratum	11 inches; hard to slightly weathered volcanic rock.	

Soil Properties & Management Interpretations

Effective Rooting Depth (inches)	12 to 20	
Available Water Capacity Class	Very low	
AWC for top 20"	1.2-1.4	
Permeability: Subsoil	Moderately rapid	
Substratum	Very slow	
Drainage Class	Somewhat excessively drained	
Max Erosion Hazard	Very high	
Seedling Mortality	Severe	
Revegetating Exposed Subsoil	Severe	
Soil Productivity		
Forest Survey Site Class	Not capable	
Annual Forage (lbs/acre)	Not rated	
Soil Manageability		
Group	IV	
Class	4Ed	
Inclusions	Included in this unit are small areas of Waca soils; soils similar to Meiss with 35 to 75 percent rock fragments; soils similar to Meiss but with ochric epipedons; alluvial fans at the bottom of the unit; and very shallow soils. Included areas make up about 15 percent of the total area.	
Management Considerations	Steep and very steep slopes. Surface soils have been eroded. On-site investigations are necessary to determine if corrective treatment is needed. Meiss soils are shallow to hard bedrock. They reach field capacity rapidly and can produce surface runoff. Concentrated surface runoff from areas of Rock outcrop can increase erosion on adjacent soils.	

✓ **MKE Meiss-Waca complex, 2 to 30 percent slopes**

Elevation: 6,000 to 9,000 feet Annual Precipitation: 50 to 80 inches

Typical Vegetation Wyethia-Red fir series.

Soil Map Unit Components	Meiss	Waca
Proportion (percent)	55	30

Soil Profile Description

	Meiss	Waca
Surface Layer	0 to 19 inches; brown sandy loam; moderate granular structure; neutral.	0 to 12 inches; grayish brown gravelly sandy loam; moderate granular structure; medium acid.
Subsoil		12 to 32 inches; yellowish brown very gravelly sandy loam; massive; medium acid.
Substratum	19 inches; hard volcanic rock.	32 inches; weathered andesitic tuff breccia.

Soil Properties & Management Interpretations

	Meiss	Waca
Effective Rooting Depth (inches)	12 to 20	20 to 40
Available Water Capacity Class	Very low	Low
AWC for top 20"	2.6-2.9	2.1-2.3
Permeability: Subsoil	Moderately rapid	Moderately rapid
Substratum	Very slow	Slow
Drainage Class	Somewhat excessively drained	Well drained
Max Erosion Hazard	High	Moderate
Seedling Mortality	Slight	Moderate to slight
Revegetating Exposed Subsoil	Severe	Slight
Soil Productivity		
Forest Survey Site Class	Not capable	4,5 RF, WF
Annual Forage (lbs/acre)	60 to 160	60 to 140
Soil Manageability		
Group	II	II
Class	2ed	2ep

Inclusions Included in this unit are small areas of Windy soils; Rock outcrop; soils similar to Meiss but with 35 to 75 percent rock fragments; soils similar to Waca but with less than 35 percent rock fragments; and deep glacial soils with more than 35 percent rock fragments. Included areas make up about 15 percent of the total area.

Management Considerations Meiss soils are shallow to hard bedrock, they reach field capacity rapidly, and are capable of producing surface runoff. Waca soils are moderately deep and have a high amount of rock fragments. Snowmelt tends to accumulate for short periods over the impermeable substratum.

MKF Meiss-Waca complex, 30 to 50 percent slopes

Elevation: 6,000 to 9,000 feet Annual Precipitation: 50 to 80 inches

Typical Vegetation Wyethia-Red fir series.

Soil Map Unit
Components

Meiss

Waca

Proportion (percent)

55

30

Soil Profile Description

Surface Layer

0 to 19 inches; brown sandy loam; moderate granular structure; neutral.

0 to 12 inches; grayish brown gravelly sandy loam; moderate granular structure; medium acid.

Subsoil

12 to 32 inches; yellowish brown very gravelly sandy loam; massive; medium acid.

Substratum

19 inches; hard volcanic rock.

32 inches; weathered andesitic tuff breccia.

Soil Properties & Management Interpretations

Effective Rooting
Depth (inches)

12 to 20

20 to 40

Available Water
Capacity Class

Very low

Low

AWC for top 20"

2.6-2.9

2.1-2.3

Permeability: Subsoil
 Substratum

Moderately rapid
Very slow

Moderately rapid
Slow

Drainage Class

Somewhat excessively drained

Well drained

Max Erosion Hazard

High

High

Seedling Mortality

Slight

Moderate to slight

Revegetating Exposed
Subsoil

Severe

Slight

Soil Productivity

Forest Survey Site Class
Annual Forage (lbs/acre)

Not capable
60 to 160

4,5 RF, WF
60 to 140

Soil Manageability
Group
Class

III
3Ed

III
3Ep

Inclusions

Included in this unit are small areas of Windy soils; Rock outcrop; soils similar to Meiss but with a high amount of rock fragments; and soils similar to Waca but with less than 35 percent rock fragments.

Management
Considerations

Steep slopes. Meiss soils are shallow to hard bedrock, they reach field capacity rapidly, and are capable of producing surface runoff. Waca soils are moderately deep, have a high amount of rock fragments, and snowmelt tends to accumulate for short periods over the impermeable substratum.

MKF3 Meiss-Waca-Rock outcrop complex, 30 to 50 percent slopes, severely eroded

Elevation: 6,500 to 9,000 feet Annual Precipitation: 60 to 80 inches

Typical Vegetation Wyethia series; Wyethia-Red fir series.

Soil Map Unit Components	Meiss, severely eroded	Waca, severely eroded	Rock outcrop
Proportion (percent)	45	30	15

Soil Profile Description

	Meiss, severely eroded	Waca, severely eroded	Rock outcrop
Surface Layer	0 to 2 inches; grayish brown gravelly loamy sand; single grain structure; slightly acid.	0 to 9 inches; dark grayish brown loamy sand; weak granular structure; slightly acid.	Merhten mudflow exposures.
Subsoil	2 to 11 inches; brown gravelly sandy loam; massive; slightly acid.	9 to 21 inches; brown very cobbly sandy loam; massive; medium acid.	
Substratum	11 inches; hard to slightly weathered volcanic rock.	21 inches; slightly weathered tuff breccia mudflow.	

Soil Properties & Management Interpretations

Effective Rooting Depth (inches)	12 to 20	20 to 40
Available Water Capacity Class	Very low	Very low
AWC for top 20"	1.2-1.4	2.6-2.9
Permeability: Subsoil	Moderately rapid	Moderately rapid
Substratum	Very slow	Slow
Drainage Class	Somewhat excessively drained	Well drained
Max Erosion Hazard	Very high	Very high
Seedling Mortality	Severe	Moderate
Revegetating Exposed Subsoil	Severe	Slight
Soil Productivity		
Forest Survey Site Class	Not rated	Not rated
Annual Forage (lbs/acre)	Not rated	Not rated
Soil Manageability		
Group	IV	IV
Class	4Ed	4Ep
Inclusions	Included in this unit are small areas of soils similar to Meiss but with high amounts of rock fragments; soils similar to Meiss but with ochric epipedons; and very shallow soils. Included areas make up about 10 percent of the total area.	
Management Considerations	Steep slopes. Surface soils have been eroded and on-site investigations are necessary to determine if corrective treatments are needed. Meiss soils are shallow to hard bedrock, they reach field capacity rapidly, and can produce surface runoff. Waca soils are moderately deep, have a high amount of rock fragments, and snowmelt tends to accumulate for short periods over the impermeable substratum. Concentrated surface runoff from areas of Rock outcrop can increase erosion on adjacent soils.	

MLE Meiss-Waca-Cryumbrepts, wet complex, 2 to 30 percent slopes

Elevation: 6,000 to 9,000 feet Annual Precipitation: 50 to 80 inches

Typical Vegetation Wyethia-Alder/Willow series; Red fir series.

Soil Map Unit Components	Meiss	Waca	Cryumbrepts, wet
Proportion (percent)	50	20	15

Soil Profile Description

Soil Profile Description	Meiss	Waca	Cryumbrepts, wet
Surface Layer	0 to 19 inches; brown sandy loam; moderate granular structure; neutral.	0 to 12 inches; grayish brown gravelly sandy loam; moderate granular structure; medium acid.	Thick and dark colored; stratified sandy loam, silt loam, and clay loam; gravelly, cobbly, or stony.
Subsoil		12 to 32 inches; yellowish brown very gravelly sandy loam; massive; medium acid.	
Substratum	19 inches; hard volcanic rock.	32 inches; weathered andesitic tuff breccia.	Stratified loam to clay loam with dark colored mottles; gravelly, cobbly, or stony.

Soil Properties & Management Interpretations

Effective Rooting Depth (inches)	12 to 20	20 to 40	Variable
Available Water Capacity Class	Very low	Low	Very low
AWC for top 20"	2.6-2.9	2.1-2.3	
Permeability: Subsoil	Moderately rapid	Moderately rapid	Modertely rapid
Substratum	Very slow	Slow	Very slow
Drainage Class	Somewhat excessively drained	Well drained	Poorly drained
Max Erosion Hazard	High	Moderate	Very high
Seedling Mortality	Slight	Slight to moderate	Severe
Revegetating Exposed Subsoil	Severe	Slight	Moderate
Soil Productivity			
Forest Survey Site Class	Not capable	4,5 RF, WF	Not capable
Annual Forage (lbs/acre)	60 to 160	60 to 160	170 to 640
Soil Manageability			
Group	II	II	II
Class	2ed	2ep	4EW

Inclusions Included in this unit are small areas of Windy soils; Rock outcrop; soils similar to Meiss but with high amounts of rock fragments; and soil similar to Waca but with low amounts of rock fragments. Included areas make up about 15 percent of the total area.

Management Considerations Meiss soils are shallow to hard bedrock, they reach field capacity rapidly, and can produce surface runoff. Waca soils are moderately deep, have a high amount of coarse fragments, and snowmelt tends to accumulate for short periods over the impermeable substratum. Cryumbrepts, wet have a high water table most of the year, are susceptible to puddling, and often have impermeable layers between 1 and 2 feet.

MLG Meiss-Waca-Cryumbrepts, wet complex, 30 to 75 percent slopes

Elevation: 6,000 to 9,000 feet Annual Precipitation: 50 to 80 inches

Typical Vegetation Wyethia-Alder/Willow series; Red fir series.

Soil Map Unit Components	Meiss	Waca	Cryumbrepts, wet
Proportion (percent)	50	20	15

Soil Profile Description

Surface Layer	0 to 19 inches; brown sandy loam; moderate granular structure; neutral.	0 to 12 inches; grayish brown gravelly sandy loam; moderate granular structure; medium acid.	Thick and dark colored; stratified sandy loam, silt loam, and clay loam; gravelly, cobbly, or stony.
Subsoil		12 to 32 inches; yellowish brown very gravelly sandy loam; massive; medium acid.	
Substratum	19 inches; hard volcanic rock.	32 inches; weathered andesitic tuff breccia.	Stratified loam to clay loam with dark colored mottles; gravelly, cobbly, or stony.

Soil Properties & Management Interpretations

Effective Rooting Depth (inches)	12 to 20	20 to 40	Variable
Available Water Capacity Class	Very low	Low	Very low
AWC for top 20"	2.6-2.9	2.1-2.3	
Permeability: Subsoil	Moderately rapid	Moderately rapid	Moderately rapid
Substratum	Very slow	Slow	Very slow
Drainage Class	Somewhat excessively drained	Well drained	Poorly drained
Max Erosion Hazard	High	High	Very high
Seedling Mortality	Slight	Slight to moderate	Severe
Revegetating Exposed Subsoil	Severe	Slight	Severe
Soil Productivity			
Forest Survey Site Class	Not capable	4,5 RF, WF	Not capable
Annual Forage (lbs/acre)	60 to 160	60 to 140	170 to 640
Soil Manageability			
Group	IV	IV	IV
Class	4Ed	4Ep	4EW

Inclusions Included in this unit are small areas of Windy soils and Rock outcrop. Included areas make up about 15 percent of the total area.

Management Considerations Steep and very steep slopes. Meiss soils are shallow to hard bedrock, they reach field capacity rapidly, and can produce surface runoff. Waca soils are moderately deep, have a high amount of rock fragments, and snowmelt tends to accumulate for short periods over the impermeable substratum. Cryumbrepts, wet have a high water table most of the year, are susceptible to puddling, and often have impermeable layers between 1 and 2 feet.

MMG Rock outcrop, metamorphic-Putt-Deadwood complex, 30 to 75 percent slopes

Elevation: 3,600 to 6,000 feet Annual Precipitation: 60 to 65 inches

Typical Vegetation Barren-Mixed conifer series.

Soil Map Unit Components	Rock outcrop, metamorphic	Putt	Deadwood
Proportion (percent)	55	15	15

Soil Profile Description

Soil Profile Description	Rock outcrop, metamorphic	Putt	Deadwood
Surface Layer	Glaciated metamorphic rock.	0 to 20 inches; dark grayish brown very cobbly sandy loam; moderate granular structure; slightly acid.	0 to 3 inches; dark gray very gravelly sandy loam; weak subangular blocky structure; medium acid.
Subsoil		20 to 55 inches; pale yellow very cobbly sandy loam; weakly cemented with silica.	3 to 13 inches; light yellowish brown extremely gravelly sandy loam; weak subangular blocky structure; medium acid.
Substratum			13 inches; hard metasedimentary rock.

Soil Properties & Management Interpretations

Soil Properties & Management Interpretations	Rock outcrop, metamorphic	Putt	Deadwood
Effective Rooting Depth (inches)	metamorphic	20 to 34	10 to 20
Available Water Capacity Class		Very low	Very low
AWC for top 20"		0.9-1.1	0.4-0.7
Permeability: Subsoil		Moderately rapid	Moderately rapid
Permeability: Substratum		Very slow	Slow
Drainage Class		Well drained	Somewhat excessively drained
Max Erosion Hazard		High	High
Seedling Mortality		Severe	Severe
Revegetating Exposed Subsoil		Moderate	Severe
Soil Productivity			
Forest Survey Site Class		5 P	7 P
Annual Forage (lbs/acre)		70 to 120	20 to 80
Soil Manageability			
Group		IV	IV
Class		4EP	4EP

Inclusions Included in this unit are small areas of Zeibrigt soils and shallow soils with a high amount of rock fragments underlain by rock or a duripan. Included areas make up about 15 percent of the total area.

Management Considerations Steep and very steep slopes. High amounts of rock fragments. Putt soils are moderately deep and have a root restricting pan. Deadwood soils are shallow to hard bedrock and have coarse textures. They reach field capacity rapidly and can produce surface runoff. Concentrated surface runoff for areas of Rock outcrop can increase erosion on adjacent soils. Rock outcrop areas are a potential source of aggregate.

MMH Rock outcrop, metamorphic-Rubble land-Gullied land complex

Elevation: 3,500 to 8,500 feet Annual Precipitation: 60 to 80 inches

Typical Vegetation Barren; Barren-Mixed brush series.

Soil Map Unit Components	Rock outcrop, metamorphic	Rubble land	Gullied land
Proportion (percent)	55	15	15

Soil Profile Description

Surface Layer	Glaciated metamorphic rock.	Angular stones and cobbles with some soil material between rock fragments.	Mostly exposed andesitic tuff-breccia with some thin soil material on the gully sides.
Subsoil			
Substratum			

Soil Properties & Management Interpretations

Effective Rooting Depth (inches) metamorphic

Available Water Capacity Class

AWC for top 20"

Permeability: Subsoil
Substratum

Drainage Class

Max Erosion Hazard

Seedling Mortality

Revegetating Exposed Subsoil

Soil Productivity
Forest Survey Site Class
Annual Forage (lbs/acre)

Soil Manageability
Group
Class

Inclusions

Included in this unit are small areas of Woodseye soils. Included areas make up about 15 percent of the total area.

Management Considerations

Very steep slopes (50 to 100 percent). Concentrated surface runoff from Rock outcrop areas can increase erosion on adjacent soils. Rubble land areas have a potential of raveling. Gullied land areas produce concentrated surface runoff than can increase the erosion on adjacent soils. These land need on-site investigations to determine if restoration is needed. Metamorphic Rock outcrop and Rubble land are a potential source of aggregate.

MMRE Rock outcrop, metamorphic-Tinker-Cryumbrepts, wet complex, 2 to 30 percent slopes

Elevation: 6,000 to 8,600 feet Annual Precipitation: 50 to 80 inches

Typical Vegetation Barren-Conifer/Meadows series; Mixed brush-Conifer/Meadows series.

Soil Map Unit Components	Rock outcrop, metamorphic	Tinker	Cryumbrepts, wet
Proportion (percent)	50	15	10

Soil Profile Description

	Rock outcrop, metamorphic	Tinker	Cryumbrepts, wet
Surface Layer	Glaciated metamorphic rock.	0 to 21 inches; brown cobbly loam; weak granular structure; medium acid.	Thick and dark colored; stratified sandy loam, silt loam, and clay loam; gravelly, cobbly, or stony.
Subsoil		21 to 33 inches; reddish brown very cobbly loam; massive; slightly acid.	
Substratum		33 inches; pale olive cobbly coarse sandy loam; weakly cemented with silica.	Stratified loam to clay loam with dark colored mottles; gravelly, cobbly, or stony.

Soil Properties & Management Interpretations

	metamorphic	Tinker	Cryumbrepts, wet
Effective Rooting Depth (inches)	metamorphic	22 to 40	Variable
Available Water Capacity Class		Very low	Very low
AWC for top 20"		1.4-1.6	
Permeability: Subsoil		Moderately rapid	Moderately rapid
Substratum		Very slow	Very slow
Drainage Class		Well drained	Poorly drained
Max Erosion Hazard		High	Very high
Seedling Mortality		Severe to moderate	Severe
Revegetating Exposed Subsoil		Moderate	Severe
Soil Productivity			
Forest Survey Site Class		7	Not capable
Annual Forage (lbs/acre)		270 to 380	170 to 640
Soil Manageability			
Group		IV	IV
Class		4EpX	4EW

Inclusions Included in this unit are small areas of Putt, Smokey, Tallac, and Woodseye soils. Included areas make up about 25 percent of the total area.

Management Considerations Concentrated surface runoff from areas of Rock outcrop can increase erosion on adjacent soils. Tinker soils are moderately deep to a root restricting pan, have a high amount of rock fragments, and the subsoil remains moist above the pan during most of the growing season. Cryumbrepts, wet have a high water table most of the year, are susceptible to puddling, and often have impermeable layers between 1 and 2 feet. Metamorphic Rock outcrop areas are a potential source of aggregate.

MMRG Rock outcrop, metamorphic-Tinker-Cryumbrepts, wet complex, 30 to 75 percent slopes

Elevation: 6,000 to 8,600 feet Annual Precipitation: 50 to 80 inches

Typical Vegetation Barren-Conifer/Meadows series; Mixed brush-Conifer/Meadows series.

Soil Map Unit Components	Rock outcrop, metamorphic	Tinker	Cryumbrepts, wet
Proportion (percent)	50	15	10

Soil Profile Description

Surface Layer	Glaciated metamorphic rock.	0 to 21 inches; brown cobbly loam; weak granular structure; medium acid.	Thick and dark colored; stratified sandy loam, silt loam, and clay loam; gravelly, cobbly, or stony.
Subsoil		21 to 33 inches; reddish brown very cobbly loam; massive; slightly acid.	
Substratum		33 inches; pale olive cobbly coarse sandy loam; weakly cemented with silica.	Stratified loam to clay loam with dark colored mottles; gravelly, cobbly, or stony.

Soil Properties & Management Interpretations

Effective Rooting Depth (inches)	metamorphic	22 to 40	Variable
Available Water Capacity Class		Very low	Very low
AWC for top 20"		1.4-1.6	
Permeability: Subsoil		Moderately rapid	Moderately rapid
Substratum		Very slow	Very slow
Drainage Class		Well drained	Poorly drained
Max Erosion Hazard		High	Very high
Seedling Mortality		Severe to moderate	Severe
Revegetating Exposed Subsoil		Moderate	Severe
Soil Productivity			
Forest Survey Site Class		7	Not capable
Annual Forage (lbs/acre)		270 to 380	170 to 640
Soil Manageability			
Group		IV	IV
Class		4EpX	4EW

Inclusions Included in this unit are small areas of Smokey, Tallac, and Woodseye soils; and moderately deep soils with an umbric epipedon and a high amount of rock fragments. Included areas make up about 25 percent of the total area.

Management Considerations Steep and very steep slopes. Concentrated runoff from Rock outcrop areas can increase erosion on adjacent soils. Tinker soils are moderately deep to a root restricting pan, have a high amount of rock fragments, and the subsoil remains moist above the pan during most of the growing season. Cryumbrepts, wet have a high water table most of the year, are susceptible to puddling, and often have impermeable layers between 1 and 2 feet. Metamorphic Rock outcrop areas are a potential source of aggregate.

MNG Rock outcrop, metamorphic-Woodseye complex, 30 to 75 percent slopes

Elevation: 6,000 to 8,600 feet Annual Precipitation: 50 to 80 inches

Typical Vegetation Barren-Mixed brush series.

Soil Map Unit **Rock outcrop, metamorphic** **Woodseye**

Components

Proportion (percent) 70 15

Soil Profile Description

Surface Layer	Glaciated metamorphic rock.	0 to 14 inches; very dark grayish brown very gravelly sandy loam; weak granular structure; medium acid.
Subsoil		14 to 19 inches; light yellowish brown extremely gravelly loam; massive; slightly acid.
Substratum		19 inches; hard metasedimentary rock.

Soil Properties & Management Interpretations

Effective Rooting Depth (inches)	metamorphic	9 to 20
Available Water Capacity Class		Very low
AWC for top 20"		0.6-1.0
Permeability: Subsoil		Moderate
Substratum		Very slow
Drainage Class		Somewhat excessively drained
Max Erosion Hazard		High
Seedling Mortality		Severe
Revegetating Exposed Subsoil		Severe
Soil Productivity		
Forest Survey Site Class		Not capable
Annual Forage (lbs/acre)		160 to 270
Soil Manageability		
Group		IV
Class		4EP
Inclusions	Included in this unit are small areas of Lorack, Smokey, and Tinker soils; Rubble land; and soils similar to Woodseye but with thin dark surface layers. Included areas make up about 15 percent of the total area.	
Management Considerations	Steep and very steep slopes. Concentrated surface runoff from Rock outcrop areas can increase erosion on adjacent soils. Woodseye soils are shallow to hard bedrock, have a thin surface layer, and have a high amount of rock fragments. These soils reach field capacity rapidly and can produce surface runoff. Metamorphic Rock outcrop areas are a potential source of aggregate.	

MOE Franktown-Aldi-Rock outcrop complex, 2 to 30 percent slopes

Elevation: 5,200 to 6,500 feet Annual Precipitation: 20 to 30 inches

Typical Vegetation Sagebrush-Bitterbrush series; Sagebrush-Mahogany series.

Soil Map Unit Components	Franktown	Aldi	Rock outcrop
Proportion (percent)	45	25	15

Soil Profile Description

Surface Layer	0 to 15 inches; brown gravelly loam; moderate granular structure; slightly acid.	0 to 8 inches; brown loam; weak granular structure; slightly acid.	Volcanic rock.
Subsoil		8 to 18 inches; brown clay loam; moderate angular blocky structure; neutral.	
Substratum	15 inches; weathered volcanic rock.	18 inches; weathered andesite.	

Soil Properties & Management Interpretations

Effective Rooting Depth (inches)	15 to 20	10 to 20
Available Water Capacity Class	Very low	Very low to low
AWC for top 20"	1.1-1.3	2.7-3.3
Permeability: Subsoil	Moderately rapid	Slow
Substratum	Very slow	Very slow
Drainage Class	Well drained	Well drained
Max Erosion Hazard	High	High
Seedling Mortality	Severe	Slight
Revegetating Exposed Subsoil	Severe	Severe
Soil Productivity		
Forest Survey Site Class	Not capable	Not capable
Annual Forage (lbs/acre)	60 to 120	120 to 190
Soil Manageability		
Group	II	II
Class	2ep	2e

Inclusions Included in this unit are small areas of Kyburz soils; soils similar to Aldi but are fine-loamy; soils similar to Franktown but have an ochric epipedon; and moderately deep soils similar to Franktown. Included areas make up about 15 percent of the total area.

Management Considerations Franktown soils are shallow to bedrock and have a high amount of rock fragments. Aldi soils are shallow to hard bedrock, have very low subsoil strength when wet, and have a subsoil that tends to perch water during the spring. Both of these soils reach field capacity rapidly and can produce surface runoff. Concentrated surface runoff from areas of Rock outcrop can increase erosion on adjacent soils. Rock outcrop areas are a potential source of aggregate.

MOG Franktown-Aldi-Rock outcrop complex, 30 to 75 percent slopes.

Elevation: 5,200 to 6,500 feet Annual Precipitation: 15 to 30 inches

Typical Vegetation Sagebrush-Bitterbrush series; Sagebrush-Mahogany series.

Soil Map Unit Components	Franktown	Aldi	Rock outcrop
Proportion (percent)	50	20	15

Soil Profile Description

Surface Layer	0 to 15 inches; brown gravelly loam; moderate granular structure; slightly acid.	0 to 8 inches; brown loam; weak granular structure; slightly acid.	Volcanic rock.
Subsoil		8 to 18 inches; brown clay loam; moderate angular blocky structure; neutral.	
Substratum	15 inches; weathered volcanic rock.	18 inches; weathered andesite.	

Soil Properties & Management Interpretations

Effective Rooting Depth (inches)	15 to 20	10 to 20
Available Water Capacity Class	Very low	Very low to low
AWC for top 20"	1.1-1.3	2.7-3.3
Permeability: Subsoil	Moderately rapid	Slow
Substratum	Very slow	Very slow
Drainage Class	Well drained	Well drained
Max Erosion Hazard	Very high	Very high
Seedling Mortality	Severe	Slight
Revegetating Exposed Subsoil	Severe	Severe
Soil Productivity		
Forest Survey Site Class	Not capable	Not capable
Annual Forage (lbs/acre)	60 to 120	120 to 190
Soil Manageability		
Group	IV	IV
Class	4Ep	4E
Inclusions	Included in this unit are small areas of Kyburz soils; soils similar to Aldi but are fine-loamy; and soils similar to Franktown but with a low amount of rock fragments. Included areas make up about 15 percent of the total area.	
Management Considerations	Steep and very steep slopes. Franktown soils are shallow to bedrock and have a high amount of rock fragments. Aldi soils are shallow to hard bedrock, have very low subsoil strength when wet, and have a subsoil that tends to perch water during the spring. Both of these soils reach field capacity rapidly and can produce surface runoff. Concentrated surface runoff from areas of Rock outcrop can increase erosion on adjacent soils. Rock outcrop areas are a potential source of aggregate.	

✓ **MPC Fugawee Variant-Aquolls-Fugawee complex, 2 to 9 percent slopes**

Elevation: 6,000 to 8,000 feet Annual Precipitation: 35 to 60 inches

Typical Vegetation Sagebrush/Bitterbrush-Meadow/Willow series.

Soil Map Unit Components	Fugawee Variant	Aquolls	Fugawee
Proportion (percent)	25	20	15

Soil Profile Description

Surface Layer	0 to 5 inches; dark brown loam; moderate granular structure; neutral.	Thick and dark colored; stratified coarse sand to clay.	0 to 7 inches; dark brown sandy loam; moderate granular structure; slightly acid
Subsoil	5 to 18 inches; dark brown cobbly clay loam; moderate subangular blocky structure; strongly acid.	Stratified layers with mottles; sandy loam to clay; some are very gravelly.	7 to 35 inches; light reddish brown gravelly clay loam; moderate subangular blocky structure; strongly acid.
Substratum	18 inches; weathered andesitic rock.	Stratified alluvium.	35 inches; weathered andesite.

Soil Properties & Management Interpretations

Effective Rooting Depth (inches)	15 to 20	10 to 30	20 to 40
Available Water Capacity Class	Very low	Variable	Low
AWC for top 20"	2.5-3.0		2.1-2.7
Permeability: Subsoil	Slow	Variable	Moderate to moderately slow
Substratum	Very slow	Slow to very slow	Moderately slow
Drainage Class	Well drained	Very poorly drained	Well drained
Max Erosion Hazard	High	High	High
Seedling Mortality	Moderate to slight	Severe	Slight
Revegetating Exposed Subsoil	Slight	Severe	Slight
Soil Productivity			
Forest Survey Site Class	Not capable	Not capable	5,6 P
Annual Forage (lbs/acre)	60 to 160	1,040 to 2,670	70 to 120
Soil Manageability			
Group	II	II	II
Class	2e	4EW	2p

Inclusions Included in this unit are small areas of Jorge, Kyburz, Tahoma, and Trojan soils; Borolls; and shallow soils with a clayey subsoil. Included areas make up about 15 percent of the total area.

Management Considerations Fugawee Variant soils are shallow to bedrock and have a thin surface layer. These soils reach field capacity rapidly and can produce surface runoff. Aquolls have a high water table during most of the year, are susceptible to puddling, and are subject to flooding. Fugawee soils are moderately deep and have a thin surface layer.

MRE Fugawee Variant-Fugawee complex, 2 to 30 percent slopes

Elevation: 6,000 to 8,000 feet Annual Precipitation: 35 to 60 inches

Typical Vegetation Sagebrush/Bitterbrush-Jeffrey/Ponderosa series.

Soil Map Unit Components	Fugawee Variant	Fugawee
Proportion (percent)	55	30

Soil Profile Description

Surface Layer	0 to 5 inches; dark brown loam; moderate granular structure; neutral.	0 to 7 inches; dark brown sandy loam; moderate granular structure; slightly acid
Subsoil	5 to 18 inches; dark brown cobbly clay loam; moderate subangular blocky structure; strongly acid.	7 to 35 inches; light reddish brown gravelly clay loam; moderate subangular blocky structure; strongly acid.
Substratum	18 inches; weathered andesitic rock.	35 inches; weathered andesite.

Soil Properties & Management Interpretations

Effective Rooting Depth (inches)	15 to 20	20 to 40
Available Water Capacity Class	Very low	Low
AWC for top 20"	2.5-3.0	2.1-2.7
Permeability: Subsoil	Slow	Moderate to moderately slow
Substratum	Very slow	Moderately slow
Drainage Class	Well drained	Well drained
Max Erosion Hazard	High	High
Seedling Mortality	Moderate to slight	Slight
Revegetating Exposed Subsoil	Slight	Slight
Soil Productivity		
Forest Survey Site Class	Not capable	5,6 P
Annual Forage (lbs/acre)	60 to 160	70 to 120
Soil Manageability		
Group	II	II
Class	2e	2ep
Inclusions	Included in this unit are small areas of Jorge and Tahoma soils; Rock outcrop; and shallow soils with a clayey subsoil. Included areas make up about 15 percent of the total area.	
Management Considerations	Fugawee Variant soils are shallow to bedrock, have a thin surface layer, reach field capacity rapidly, and can produce surface runoff. Fugawee soils are moderately deep and have a thin surface layer.	

MRG Fugawee Variant-Fugawee-Rock outcrop complex, 30 to 75 percent slopes

Elevation: 6,000 to 8,000 feet Annual Precipitation: 35 to 60 inches

Typical Vegetation Sagebrush/Bitterbrush-Jeffrey/Ponderosa series.

Soil Map Unit Components	Fugawee Variant	Fugawee	Rock outcrop
Proportion (percent)	45	20	15

Soil Profile Description

Soil Profile Description	Fugawee Variant	Fugawee	Rock outcrop
Surface Layer	0 to 5 inches; dark brown loam; moderate granular structure; neutral.	0 to 7 inches; dark brown sandy loam; moderate granular structure; slightly acid	Volcanic rock.
Subsoil	5 to 18 inches; dark brown cobbly clay loam; moderate subangular blocky structure; strongly acid.	7 to 35 inches; light reddish brown gravelly clay loam; moderate subangular blocky structure; strongly acid.	
Substratum	18 inches; weathered andesitic rock.	35 inches; weathered andesite.	

Soil Properties & Management Interpretations

Soil Properties & Management Interpretations	Fugawee Variant	Fugawee
Effective Rooting Depth (inches)	15 to 20	20 to 40
Available Water Capacity Class	Very low	Low
AWC for top 20"	2.5-3.0	2.1-2.7
Permeability: Subsoil	Slow	Moderate to moderately slow
Substratum	Very slow	Moderately slow
Drainage Class	Well drained	Well drained
Max Erosion Hazard	High	High
Seedling Mortality	Moderate to slight	Slight
Revegetating Exposed Subsoil	Moderate	Slight
Soil Productivity		
Forest Survey Site Class	Not capable	5,6 P
Annual Forage (lbs/acre)	60 to 160	70 to 120
Soil Manageability		
Group	IV	IV
Class	4E	4Ep

Inclusions Included in this unit are small areas of Jorge, Kyburz, and Tahoma soils; and shallow soils with a clayey subsoil. Included areas make up about 20 percent of the total area.

Management Considerations Steep and very steep slopes. Fugawee Variant soils are shallow to bedrock and have a thin surface layer. These soils reach field capacity rapidly and can produce surface runoff. Fugawee soils are moderately deep and have a thin surface layer. Concentrated surface runoff from areas of Rock outcrop can increase erosion on adjacent soils. Rock outcrop areas are a potential source of aggregate.

MUE Tahoma Variant-Hotaw Variant-Cryumbrepts, wet complex, 2 to 30 percent slopes

Elevation: 5,500 to 6,500 feet Annual Precipitation: 50 to 70 inches

Typical Vegetation

Mixed conifer-Alder/Willow series; Red fir-Alder/Willow series.

Soil Map Unit Components

Tahoma Variant **Hotaw Variant** **Cryumbrepts, wet**

Proportion (percent)

35 20 15

Soil Profile Description

Surface Layer

0 to 5 inches; brown gravelly loam; weak granular structure; medium acid. 0 to 4 inches; brown gravelly loam; weak granular structure; slightly acid. Thick and dark colored; stratified sandy loam, silt loam, and clay loam; gravelly, cobbly, or stony.

Subsoil

5 to 48 inches; strong brown clay loam; moderate subangular blocky structure; strongly acid. 4 to 38 inches; reddish yellow gravelly clay loam; moderate subangular blocky structure; medium acid.

Substratum

48 inches; highly weathered granitic rock. 38 inches; weathered granitic rock. Stratified loam to clay loam with dark colored mottles; gravelly, cobbly, or stony.

Soil Properties & Management Interpretations

Effective Rooting Depth (inches)

40 to 80 20 to 40 Variable

Available Water Capacity Class

Low to moderate Low Very low

AWC for top 20"

2.4-2.9 2.6-3.0

Permeability: Subsoil Substratum

Moderately slow Slow Moderately slow Moderately slow Moderately rapid Very slow

Drainage Class

Well drained Well drained Poorly drained

Max Erosion Hazard

High High Very high

Seedling Mortality

Slight Slight Severe

Revegetating Exposed Subsoil

Slight Slight Severe

Soil Productivity

Forest Survey Site Class Annual Forage (lbs/acre)

2,3 RF 140 to 220 3,2 RF 140 to 220 Not capable 170 to 640

Soil Manageability

Group Class

II 2ep II 2e II 4EW

Inclusions

Included in this unit are small areas of Chaix Variant, Holland, Hotaw, and Musick soils; Rock outcrop; soils similar to Hotaw Variant but with redder colors and clay loam textures in the A horizon; shallow coarse-loamy soils; and shallow, loamy-skeletal glacial soils. Included areas make up about 30 percent of the total area.

Management Considerations

Tahoma Variant soils have very acid subsoils. Hotaw Variant soils are moderately deep, have a low cation exchange capacity, and have very acid subsoils. Cryumbrepts, wet have a high water table most of the year, are susceptible to puddling, and often have impermeable layers between 1 and 2 feet.

MUF Tahoma Variant-Hotaw Variant-Cryumbrepts, wet complex, 30 to 50 percent slopes

Elevation: 5,500 to 6,500 feet Annual Precipitation: 50 to 70 inches

Typical Vegetation Mixed conifer-Alder/Willow series; Red fir-Alder/Willow series.

Soil Map Unit Components	Tahoma Variant	Hotaw Variant	Cryumbrepts, wet
Proportion (percent)	35	20	15

Soil Profile Description

Surface Layer	0 to 5 inches; brown gravelly loam; weak granular structure; medium acid.	0 to 4 inches; brown gravelly loam; weak granular structure; slightly acid.	Thick and dark colored; stratified sandy loam, silt loam, and clay loam; gravelly, cobbly, or stony.
Subsoil	5 to 48 inches; strong brown clay loam; moderate subangular blocky structure; strongly acid.	4 to 38 inches; reddish yellow gravelly clay loam; moderate subangular blocky structure; medium acid.	
Substratum	48 inches; highly weathered granitic rock.	38 inches; weathered granitic rock.	Stratified loam to clay loam with dark colored mottles; gravelly, cobbly, or stony.

Soil Properties & Management Interpretations

Effective Rooting Depth (inches)	40 to 80	20 to 40	Variable
Available Water Capacity Class	Low to moderate	Low	Very low
AWC for top 20"	2.4-2.9	2.6-3.0	
Permeability: Subsoil	Moderately slow	Moderately slow	Moderately rapid
Substratum	Slow	Moderately slow	Very slow
Drainage Class	Well drained	Well drained	Poorly drained
Max Erosion Hazard	High	Very high	Very high
Seedling Mortality	Slight	Slight	Severe
Revegetating Exposed Subsoil	Slight	Slight	Severe
Soil Productivity			
Forest Survey Site Class	2,3 RF	3,2 RF	Not capable
Annual Forage (lbs/acre)	140 to 220	140 to 220	170 to 640
Soil Manageability			
Group	III	III	III
Class	3Ep	3E	4EW

Inclusions Included in this unit are small areas of Chaix Variant, Holland, Hotaw, and Musick soils; Rock outcrop; soils similar to Hotaw Variant but with redder colors and clay loam textures in the A horizon; shallow coarse-loamy soils; and shallow, loamy-skeletal glacial soils. Included areas make up about 30 percent of the total area.

Management Considerations Steep slopes. Tahoma Variant soils have very acid subsoils. Hotaw Variant soils are moderately deep, have a low cation exchange capacity, and have very acid subsoils. Cryumbrepts, wet have a high water table most of the year, are susceptible to puddling, and often have impermeable layers between 1 and 2 feet.

PBE Portola gravelly fine sandy loam, 2 to 30 percent slopes

Elevation: 5,000 to 6,000 feet Annual Precipitation: 20 to 30 inches

Typical Vegetation Mixed conifer series; Jeffrey/Ponderosa series.

Soil Map Unit **Portola gravelly fine sandy loam**

Components

Proportion (percent) 85

Soil Profile Description

Surface Layer 0 to 3 inches; brown gravelly fine sandy loam; weak granular structure; strongly acid.

Subsoil 3 to 39 inches; pale brown gravelly sandy loam; weak subangular blocky structure; medium acid.

Substratum 39 inches; weathered rhyolite.

Soil Properties & Management Interpretations

Effective Rooting Depth (inches) 20 to 40

Available Water Capacity Class Low

AWC for top 20" 2.0-2.3

Permeability: Subsoil Rapid
Substratum Slow

Drainage Class Well drained

Max Erosion Hazard Moderate

Seedling Mortality Moderate to slight

Revegetating Exposed Subsoil Slight

Soil Productivity

Forest Survey Site Class 6 P
Annual Forage (lbs/acre) 120 to 190

Soil Manageability

Group II
Class 2ep

Inclusions Included in this unit are small areas of Kyburz soils; Rock outcrop; soils similar to Portola but with clay or clay loam in the subsoil and with or without a thick dark surface layer; and shallow soils. Included areas make up about 15 percent of the total area.

Management Considerations Portola soils are moderately deep and have a thin surface layer.

PBE Portola gravelly fine sandy loam, 30 to 50 percent slopes

P b F

Elevation: 5,000 to 6,000 feet Annual Precipitation: 20 to 30 inches

Typical Vegetation

Mixed conifer series; Jeffrey/Ponderosa series.

Soil Map Unit Components

Portola gravelly fine sandy loam

Proportion (percent)

85

Soil Profile Description

Surface Layer

0 to 3 inches; brown gravelly fine sandy loam; weak granular structure; strongly acid.

Subsoil

3 to 39 inches; pale brown gravelly sandy loam; weak subangular blocky structure; medium acid.

Substratum

39 inches; weathered rhyolite.

Soil Properties & Management Interpretations

Effective Rooting Depth (inches)

20 to 40

Available Water Capacity Class

Low

AWC for top 20"

2.0-2.3

Permeability: Subsoil
Substratum

Rapid
Slow

Drainage Class

Well drained

Max Erosion Hazard

High

Seedling Mortality

Moderate to slight

Revegetating Exposed Subsoil

Slight

Soil Productivity

Forest Survey Site Class
Annual Forage (lbs/acre)

6 P
120 to 190

Soil Manageability

Group
Class

III
3Ep

Inclusions

Included in this unit are small areas of Kyburz soils; Rock outcrop; soils similar to Portola but with clay or clay loam in the subsoil and with or without a thick dark surface layer; and shallow soils. Included areas make up about 15 percent of the total area.

Management Considerations

Steep slopes. Portola soils are moderately deep and have a thin surface layer.

PCG Portola-Rock outcrop complex, 30 to 75 percent slopes

Elevation: 5,000 to 6,000 feet Annual Precipitation: 20 to 30 inches

Typical Vegetation Mixed conifer-Sagebrush/Bitterbrush series.

Soil Map Unit Components	Portola	Rock outcrop
Proportion (percent)	60	25

Soil Profile Description

Surface Layer	0 to 3 inches; brown gravelly fine sandy loam; weak granular structure; strongly acid.	Volcanic rock.
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Subsoil	3 to 39 inches; pale brown gravelly sandy loam; weak subangular blocky structure; medium acid.
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Substratum	39 inches; weathered rhyolite.
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Soil Properties & Management Interpretations

Effective Rooting Depth (inches)	20 to 40
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Available Water Capacity Class	Low
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AWC for top 20"	2.0-2.3
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Permeability: Subsoil	Rapid
Substratum	Slow

Drainage Class	Well drained
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Max Erosion Hazard	High
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Seedling Mortality	Moderate to slight
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Revegetating Exposed Subsoil	Slight
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Soil Productivity	
Forest Survey Site Class	6 P
Annual Forage (lbs/acre)	120 to 190

Soil Manageability	
Group	IV
Class	4Ep

Inclusions	Included in this unit are small areas of Kyburz soils; Rock outcrop; soils similar to Portola but with clay or clay loam in the subsoil and with or without a thick dark surface layer; and shallow soils. Included areas make up about 15 percent of the total area.
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Management Considerations	Steep and very steep slopes. Portola soils are moderately deep and have a thin surface layer. Concentrated surface runoff from areas of Rock outcrop can increase the erosion on adjacent soils. Rock outcrop areas are a potential source of aggregate.
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PME Putt-McCarthy-Zeibright complex, 2 to 30 percent slopes

Elevation: 3,500 to 6,000 feet Annual Precipitation: 50 to 70 inches

Typical Vegetation Mixed conifer series.

Soil Map Unit Components	Putt	McCarthy	Zeibright
Proportion (percent)	30	30	25

Soil Profile Description

	Putt	McCarthy	Zeibright
Surface Layer	0 to 20 inches; dark grayish brown very cobbly sandy loam; moderate granular structure; slightly acid.	0 to 15 inches; brown gravelly sandy loam; moderate granular structure; slightly acid.	0 to 21 inches; dark brown gravelly fine sandy loam; weak granular structure; slightly acid.
Subsoil	20 to 55 inches; pale yellow very cobbly sandy loam; weakly cemented with silica.	15 to 28 inches; brown very gravelly sandy loam; weak subangular blocky structure; slightly acid.	21 to 62 inches; yellowish brown very cobbly fine sandy loam; massive; strongly acid.
Substratum		28 inches; weathered andesitic tuff breccia.	

Soil Properties & Management Interpretations

	Putt	McCarthy	Zeibright
Effective Rooting Depth (inches)	20 to 34	20 to 40	40 to 80
Available Water Capacity Class	Very low	Low	Very low to low
AWC for top 20"	0.9-1.1	2.3-2.6	1.2-1.9
Permeability: Subsoil	Moderately rapid	Moderately rapid	Moderately rapid
Substratum	Very slow	Moderately slow	Rapid
Drainage Class	Well drained	Well drained	Well drained
Max Erosion Hazard	High	High	Moderate
Seedling Mortality	Severe	Moderate	Severe to moderate
Revegetating Exposed Subsoil	Moderate	Slight	Slight
Soil Productivity			
Forest Survey Site Class	4 P, WF	4 P, WF	3 P, WF
Annual Forage (lbs/acre)	120 to 170	120 to 170	50 to 240
Soil Manageability			
Group	II	II	II
Class	4ePX	2ep	2ep
Inclusions	Included in this unit are small areas of Crozier and Ledmount soils. Included areas make up about 15 percent of the total area.		
Management Considerations	High amounts of rock fragments. Putt soils are moderately deep to a root restricting pan. McCarthy soils are moderately deep. Zeibright soils have coarse textures.		

PME Putt-McCarthy-Zeibright complex, 30 to 75 percent slopes

Elevation: 3,500 to 6,000 feet Annual Precipitation: 50 to 70 inches

Typical Vegetation Mixed conifer series.

Soil Map Unit Components	Putt	McCarthy	Zeibright
Proportion (percent)	30	25	20

Soil Profile Description

Surface Layer	0 to 20 inches; dark grayish brown very cobbly sandy loam; moderate granular structure; slightly acid.	0 to 15 inches; brown gravelly sandy loam; moderate granular structure; slightly acid.	0 to 21 inches; dark brown gravelly fine sandy loam; weak granular structure; slightly acid.
Subsoil	20 to 55 inches; pale yellow very cobbly sandy loam; weakly cemented with silica.	15 to 28 inches; brown very gravelly sandy loam; weak subangular blocky structure; slightly acid.	21 to 62 inches; yellowish brown very cobbly fine sandy loam; massive; strongly acid.
Substratum		28 inches; weathered andesitic tuff breccia.	

Soil Properties & Management Interpretations

Effective Rooting Depth (inches)	20 to 34	20 to 40	40 to 80
Available Water Capacity Class	Very low	Low	Very low to low
AWC for top 20"	0.9-1.1	2.3-2.6	1.2-1.9
Permeability: Subsoil	Moderately rapid	Moderately rapid	Moderately rapid
Substratum	Very slow	Moderately slow	Rapid
Drainage Class	Well drained	Well drained	Well drained
Max Erosion Hazard	High	High	High
Seedling Mortality	Severe	Moderate	Severe to moderate
Revegetating Exposed Subsoil	Moderate	Moderate	Slight
Soil Productivity			
Forest Survey Site Class	4 P, WF	4 P, WF	3 P, WF
Annual Forage (lbs/acre)	120 to 170	120 to 170	50 to 240
Soil Manageability			
Group	IV	IV	IV
Class	4EPX	4Ep	4Ep

Inclusions Included in this unit are small areas of Crozier and Ledmount soils. Included areas make up about 25 percent of the total area.

Management Considerations Steep and very steep slopes. High amounts of rock fragments. Putt soils are moderately deep to a root restricting pan. McCarthy soils are moderately deep. Zeibright soils have coarse textures.

PTE Putt-Rock outcrop-Cryumbrepts, wet complex, 2 to 30 percent slopes

Elevation: 4,000 to 6,000 feet Annual Precipitation: 50 to 70 inches

Typical Vegetation

Mixed conifer-Alder/Willow series.

Soil Map Unit Components

Putt

Rock outcrop

Cryumbrepts, wet

Proportion (percent)

40

20

20

Soil Profile Description

Surface Layer

0 to 20 inches; dark grayish brown very cobbly sandy loam; moderate granular structure; slightly acid.

Glaciated granitic rock.

Thick and dark colored; stratified sandy loam, silt loam, and clay loam; gravelly, cobbly, or stony.

Subsoil

20 to 55 inches; pale yellow very cobbly sandy loam; weakly cemented with silica.

Substratum

Stratified loam to clay loam with dark colored mottles; gravelly, cobbly, or stony.

Soil Properties & Management Interpretations

Effective Rooting Depth (inches)

20 to 34

Variable

Available Water Capacity Class

Very low

Very low

AWC for top 20"

0.9-1.1

Permeability: Subsoil Substratum

Moderately rapid
Very slow

Moderately rapid
Very slow

Drainage Class

Well drained

Poorly drained

Max Erosion Hazard

High

Very high

Seedling Mortality

Severe

Severe

Revegetating Exposed Subsoil

Moderate

Severe

Soil Productivity

Forest Survey Site Class
Annual Forage (lbs/acre)

4 P, WF
120 to 170

Not capable
170 to 640

Soil Manageability

Group
Class

IV
4ePX

IV
4EW

Inclusions

Included in this unit are small areas of McCarthy, Tallac, Tinker, and Zeibright soils. Included areas make up about 20 percent of the total area.

Management Considerations

Putt soils are moderately deep to a root restricting pan and have a high amount of rock fragments. Concentrated surface runoff from areas of Rock outcrop can increase erosion on adjacent soils. Cryumbrepts, wet have a high water table most of the year, are susceptible to puddling, and often have impermeable layers between 1 and 2 feet. Rock outcrop areas are a potential source of aggregate.

PUF Putt-Zeibright complex, 30 to 50 percent slopes

Elevation: 4,000 to 6,000 feet Annual Precipitation: 50 to 70 inches

Typical Vegetation

Mixed conifer series.

Soil Map Unit Components

Putt

Zeibright

Proportion (percent)

75

15

Soil Profile Description

Surface Layer

0 to 20 inches; dark grayish brown very cobbly sandy loam; moderate granular structure; slightly acid.

0 to 21 inches; dark brown gravelly fine sandy loam; weak granular structure; slightly acid.

Subsoil

20 to 55 inches; pale yellow very cobbly sandy loam; weakly cemented with silica.

21 to 62 inches; yellowish brown very cobbly fine sandy loam; massive; strongly acid.

Substratum

Soil Properties & Management Interpretations

Effective Rooting Depth (inches)

20 to 34

40 to 80

Available Water Capacity Class

Very low

Very low to low

AWC for top 20"

0.9-1.1

1.2-1.9

Permeability: Subsoil Substratum

Moderately rapid
Very slow

Moderately rapid
Rapid

Drainage Class

Well drained

Well drained

Max Erosion Hazard

High

High

Seedling Mortality

Severe

Severe

Revegetating Exposed Subsoil

Moderate

Slight

Soil Productivity

Forest Survey Site Class
Annual Forage (lbs/acre)

4 P, WF
120 to 170

3 P, WF
50 to 240

Soil Manageability Group Class

IV
4EPX

IV
#EP

Inclusions

Included in this unit are small areas of Tallac and Tinker soils; Rock outcrop; soils similar to Zeibright but with a cambic horizon; and shallow soils with a high amount of rock fragments and a duripan. Included areas make up about 10 percent of the total area.

Management Considerations

Steep slopes. High amounts of rock fragments. Putt soils are moderately deep to a root restricting pan. Zeibright soils have coarse textures.

PVE Putt-Rock outcrop, granitic-Zeibright complex, 2 to 30 percent slopes

Elevation: 4,000 to 6,000 feet Annual Precipitation: 50 to 70 inches

Typical Vegetation

Mixed conifer-Mixed brush series; Mixed conifer-Barren series.

Soil Map Unit Components

Putt

Rock outcrop

Zeibright

Proportion (percent)

45

25

20

Soil Profile Description

Surface Layer

0 to 20 inches; dark grayish brown very cobbly sandy loam; moderate granular structure; slightly acid.

Glaciated granitic rock.

0 to 21 inches; dark brown gravelly fine sandy loam; weak granular structure; slightly acid.

Subsoil

20 to 55 inches; pale yellow very cobbly sandy loam; weakly cemented with silica.

21 to 62 inches; yellowish brown very cobbly fine sandy loam; massive; strongly acid.

Substratum

Soil Properties & Management Interpretations

Effective Rooting Depth (inches)

20 to 34

40 to 80

Available Water Capacity Class

Very low

Very low to low

AWC for top 20"

0.9-1.1

1.2-1.9

Permeability: Subsoil
Substratum

Moderately rapid
Very slow

Moderately rapid
Rapid

Drainage Class

Well drained

Well drained

Max Erosion Hazard

High

Moderate

Seedling Mortality

Severe

Severe to moderate

Revegetating Exposed Subsoil

Moderate

Slight

Soil Productivity

Forest Survey Site Class
Annual Forage (lbs/acre)

4 P, WF
120 to 170

3 P, WF
50 to 240

Soil Manageability

Group
Class

IV
4ePX

IV
2ep

Inclusions

Included in this unit are small areas of Tallac and Tinker soils; and shallow soils with a high amount of rock fragments. Included areas make up about 10 percent of the total area.

Management Considerations

High amounts of rock fragments. Putt soils are moderately deep to a root restricting pan. Zeibright soils have coarse textures. Concentrated surface runoff from areas of Rock outcrop can increase erosion on adjacent soils.

PWE Putt-Rock outcrop, metamorphic-Zeibright complex, 2 to 30 percent slopes

Elevation: 3,600 to 5,500 feet Annual Precipitation: 50 to 70 inches

Typical Vegetation ✓

Mixed conifer-Barren series.

Soil Map Unit Components

Putt

Rock outcrop, metamorphic

Zeibright

Proportion (percent)

45

25

20

Soil Profile Description

Surface Layer

0 to 20 inches; dark grayish brown very cobbly sandy loam; moderate granular structure; slightly acid.

Glaciated metamorphic rock.

0 to 21 inches; dark brown gravelly fine sandy loam; weak granular structure; slightly acid.

Subsoil

20 to 55 inches; pale yellow very cobbly sandy loam; weakly cemented with silica.

21 to 62 inches; yellowish brown very cobbly fine sandy loam; massive; strongly acid.

Substratum

Soil Properties & Management Interpretations

Effective Rooting Depth (inches)

20 to 34

metamorphic

40 to 80

Available Water Capacity Class

Very low

Very low to low

AWC for top 20"

0.9-1.1

1.2-1.9

Permeability: Subsoil
Substratum

Moderately rapid
Very slow

Moderately rapid
Rapid

Drainage Class

Well drained

Well drained

Max Erosion Hazard

High

Moderate

Seedling Mortality

Severe

Severe to moderate

Revegetating Exposed Subsoil

Moderate

Slight

Soil Productivity

Forest Survey Site Class
Annual Forage (lbs/acre)

4 P, WF
120 to 170

3 P, WF
50 to 240

Soil Manageability

Group
Class

IV
4ePX

IV
2ep

Inclusions

Included in this unit are small areas of Deadwood soils and shallow soils with a high amount of rock fragments. Included areas make up about 10 percent of the total area.

Management Considerations

High amounts of rock fragments. Putt soils are moderately deep to a root restricting pan. Zeibright soils have coarse textures. Concentrated surface runoff from areas of Rock outcrop can increase erosion on adjacent soils. Metamorphic Rock outcrop areas are a potential source of aggregate.

PWG Putt-Rock outcrop, metamorphic-Zeibright complex, 30 to 75 percent slopes

Elevation: 3,600 to 5,500 feet Annual Precipitation: 50 to 70 inches

Typical Vegetation

Mixed conifer-Barren series.

Soil Map Unit Components

Putt

Rock outcrop, metamorphic

Zeibright

Proportion (percent)

45

25

20

Soil Profile Description

Surface Layer

0 to 20 inches; dark grayish brown very cobbly sandy loam; moderate granular structure; slightly acid.

Glaciated metamorphic rock.

0 to 21 inches; dark brown gravelly fine sandy loam; weak granular structure; slightly acid.

Subsoil

20 to 55 inches; pale yellow very cobbly sandy loam; weakly cemented with silica.

21 to 62 inches; yellowish brown very cobbly fine sandy loam; massive; strongly acid.

Substratum

Soil Properties & Management Interpretations

Effective Rooting Depth (inches)

20 to 34

metamorphic

40 to 80

Available Water Capacity Class

Very low

Very low to low

AWC for top 20"

0.9-1.1

1.2-1.9

Permeability: Subsoil Substratum

Moderately rapid
Very slow

Moderately rapid
Rapid

Drainage Class

Well drained

Well drained

Max Erosion Hazard

High

High

Seedling Mortality

Severe

Severe to moderate

Revegetating Exposed Subsoil

Moderate

Slight

Soil Productivity

Forest Survey Site Class
Annual Forage (lbs/acre)

4 P, WF
120 to 170

3 P, WF
50 to 240

Soil Manageability

Group
Class

IV
4ePX

IV
4ep

Inclusions

Included in this unit are small areas of Deadwood soils and shallow soils with a high amount of rock fragments. Included areas make up about 10 percent of the total area.

Management Considerations

Steep and very steep slopes. High amounts of rock fragments. Putt soils are moderately deep to a root restricting pan. Zeibright soils have coarse textures. Concentrated surface runoff from areas of Rock outcrop can increase erosion on adjacent soils. Metamorphic Rock outcrop areas are a potential source of aggregate.

PX Pits, borrow

Elevation: x feet

Annual Precipitation: x inches

Typical Vegetation

Barren.

Soil Map Unit
Components

Pits, borrow

Proportion (percent)

95

Soil Profile Description

Surface Layer

Excavations for gravel, cinders, decomposed granite, and sanitary landfills.

Subsoil

Substratum

Soil Properties & Management Interpretations

Effective Rooting
Depth (inches)

Available Water
Capacity Class

AWC for top 20"

Permeability: Subsoil
Substratum

Drainage Class

Max Erosion Hazard

Seedling Mortality

Revegetating Exposed
Subsoil

Soil Productivity
Forest Survey Site Class
Annual Forage (lbs/acre)

Soil Manageability
Group
Class

Inclusions

Included in this unit are small areas of unidentified soils. Included areas make up about 5 percent of the total area.

Management
Considerations

Borrow pits are a potential source of aggregate. These lands need on-site investigations to determine if restoration is needed.

R Riverwash

Elevation: x feet

Annual Precipitation: x inches

Typical Vegetation

Barren with a few willows and carex.

Soil Map Unit
Components

Riverwash

Proportion (percent)

95

Soil Profile Description

Surface Layer

Stony, cobbly, gravelly, or sandy stream and river deposits.

Subsoil

Substratum

Soil Properties & Management Interpretations

Effective Rooting
Depth (inches)

Available Water
Capacity Class

AWC for top 20"

Permeability: Subsoil
Substratum

Drainage Class

Max Erosion Hazard

Seedling Mortality

Revegetating Exposed
Subsoil

Soil Productivity
Forest Survey Site Class
Annual Forage (lbs/acre)

Soil Manageability
Group
Class

Inclusions

Included in this unit are small areas of Aquolls, Borolls, and Water. Included areas make up about 5 percent of the total area.

Management
Considerations

Riverwash areas are a potential source of aggregate. They are subject to flooding.