USDA icon **Natural Resources Conservation Service**

Major Land Resource Area 006X
Cascade Mountains, Eastern Slope

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Ecological site keys

MLRA 6 - North of the Columbia River

I. Resides north of Columbia River.

A. Site has over 20% cover of trees over 13 feet in height.

1 Site located in Northern Cascades; northern Chelan and Okanogan Counties; CRAs 6.1, 6.2, 6.3 and 6.4; LRU A

i. Site occurs in cryic temperature regime.

a. Site occurs in udic moisture regime. ... F006XA006WA – Cold Cryic Udic Mountain Slopes (Pacific Silver fir Cold Moist Shrub/Herb)

b. Site occurs in xeric moisture regime, but a udic moisture subclass (xeric bordering udic). ... F006XA008WA – Cryic Xeric Mountain Slopes (Subalpine fir Cold Moderately Dry Shrub/Herb)

c. Site occurs in xeric moisture regime.

1) Site occurs less than 5,000 feet elevation. ... F006XA003WA – Cryic Xeric Mountain Slopes (Subalpine fir Cool Moderately Dry Shrub/Herb)

2) Site occurs over 5,000 feet elevation. ... F006XA004WA – Cold Cryic Xeric Mountain Slopes (Subalpine fir Cold Dry Shrub)

ii. Site occurs in frigid temperature regime.

a. Plant community expresses a Douglas-fir and huckleberry plant association. ... F006XA005WA – Cool Frigid Xeric Mountain Slopes (Douglas-fir Cool Moderately Dry Shrub/Herb)

b. Plant community expresses a Douglas-fir and pinegrass plant association. ... F006XA001WA – Cool Frigid Xeric Ashy Slopes (Douglas-fir Cool Dry Grass)

c. Plant community lacks pinegrass. ... F006XA007WA – Warm Frigid Xeric Mountain Slopes (Douglas-fir Warm Dry Shrub/Herb)

iii. Site occurs in mesic temperature regime.

a. Site occurs predominantly on northern slopes. ... F006XA007WA – Warm Frigid Xeric Mountain Slopes (Douglas-fir Warm Dry Shrub/Herb)

b. Site occurs on more southerly slopes. ... F006XA002WA – Mesic Xeric Hill Slopes and Terraces (Ponderosa Pine Hot Dry Grass)

2 Site located in Central Cascades; northern Kittitas and southern Chelan counties; CRA 6.5; LRU B

i. **Site occurs in cryic temperature regime. ...** F006XB002WA – Cold Cryic Udic Mountain Slopes (Mountain Hemlock Cold Moderately Moist Shrub/Herb)

ii. **Site occurs in frigid temperature regime.**

a. **Site dominated by Douglas-fir. ...** F006XB001WA – Frigid Xeric Mountain Slopes (Douglas-fir Moderately Dry Shrub/Herb)

b. **Site dominated by grand fir. ...** F006XB003WA – Frigid Xeric Mountain Slopes (Grand fir Warm Moderately Dry Low Shrub/Herb)

iii. **Site occurs in mesic temperature regime. ...** F006XB004WA – Mesic Xeric Foothills and Mountain Slopes (Ponderosa Pine Hot Dry Shrub Grass)

3 Site located in Southern Cascades; Kittitas, Yakima, Klickitat and eastern Skamania Counties; CRAs 6.6, 6.7 and 6.8; LRU C and D.

i. **Site occurs in cryic temperature regime.**

a. **Site dominated by whitebark pine. ...** F006XD006WA – Cold Cryic Xeric Mountain Slopes (Whitebark Pine Cold Moderately Dry Shrub/Herb)

b. **Site dominated by subalpine fir. ...** F006XC001WA – Cryic Xeric Mountain Slopes and Plateaus (Subalpine fir Cool Dry Grass)

c. **Site dominated by western hemlock. ...** F006XC002WA – Cryic Moderately Moist Xeric Mountain Slopes (Western Hemlock Cool Moderately Moist)

ii. **Site occurs in frigid temperature regime.**

a. **Site on 'dry river terrace' adjacent to riparian areas. ...** F006XD003WA – Mesic Xeric Slopes and Flood Plains (Oregon white oak-Ponderosa Pine Hot Moderately Dry Shrub)

b. **Site not described as above.**

1) **Site occurs in xeric moisture regime, but a udic moisture subclass (xeric bordering udic).**

a) **Site aspect is northern. ...** F006XC003WA – Cool Frigid Moist Xeric Mountain Slopes (Grand fir Cool Moist Shrub/Herb)

b) **Site aspect is southernly. ...** F006XD001WA – Frigid Moist Xeric Ashy Slopes (Grand fir Warm Moist Shrub/Herb)

2) **Site occurs in xeric moisture regime, but a typic moisture subclass.**

a) **Site aspect is northerly. ...** F006XD005WA – Frigid Xeric Mountain Slopes and Plateaus (Grand fir Warm Moderately Dry Shrub)

b) **Sites aspect is more southernly. ...** F006XD002WA – Cool Frigid Xeric Ashy Slopes (Grand fir Cool Dry Grass)

iii. **Site occurs in mesic temperature regime.**

a. **Site contains bitterbrush and/or elk sedge. ...** F006XD004WA – Mesic Xeric Slopes and Plateaus (Oregon White Oak-Ponderosa pine Hot Dry Herb/Shrub)

b. Site contains wester hazel and/or snowberry. ... F006XD003WA – Mesic Xeric Slopes and Flood Plains (Oregon white oak-Ponderosa Pine Hot Moderately Dry Shrub)

B. Sites has less than 20% cover of trees over 13 feet in height.

1 The site occurs on uplands.

i. Soils are very shallow in depth, less than 10 inches. Sites include: ESG R006XY001WA - Very shallow, R006XY301WA - Very shallow 16-24 PZ. ... R006XY001WA – Very shallow

ii. Soils are deeper than 10 inches.

a. Soil has a shallow depth class, less than 20 inches to restrictive horizon.

1) Site occurs on the High Prairie or Swauk Prairie of MLRA 6. ESG R006XY412WA - Shallow stony, Prairie ... R006XY412WA – Shallow Stony Prairie

2) Site occurs approximately at 2,800 to 4,000 feet elevation; mesic temperature regime. Sites include: ESG R006XY312WA - Shallow stony, 2800-4000 feet, R006XY201WA - Dry Stony 16-24 PZ. ... R006XY312WA – Shallow Stony 2800-4000 feet

3) Site occurs approximately at 4,000 to 6,000 feet elevation; frigid temperature regime . Sites include: ESG R006XY112WA - Shallow stony, 4000-6000 feet, R006XY203WA - Cool Stony 16-24 PZ. ... R006XY112WA – Shallow Stony 4000-6000 feet

4) Site occurs approximately at 6,000 to 7,600 feet elevation; cryic temperature regime. Sites include: ESG R006XY115WA - Shallow stony, 6000-7600 feet, R006XY204WA - High Mountain Shallow 24+ PZ. ... R006XY115WA – Shallow Stony 6000-7600 feet

b. Soil is deeper than 20 inches to a restrictive horizon and have greater than 35 percent rock fragments in particle size control section.

1) Site occurs approximately below 2,800 feet in elevation. Sites include: ESG R006XY726WA - Stony, dry oak, R006XY201WA - Dry Stony 16-24 PZ. ... R006XY726WA – Stony Dry Oak

2) Site occurs approximately at 2,800 to 4,000 feet elevation; mesic temperature regime. Sites include: ESG R006XY226WA - Stony foothills, south aspect, bitterbrush, 2,800-4,000 feet, R006XY202WA - Stony 16-24 PZ. ... R006XY226WA – Stony Foothills South Aspect bitterbrush 2800-4000 feet

3) Site occurs approximately at 4,000 to 6,000 feet elevation; frigid temperature regime. Sites include: ESG R006XY126WA - Stony south aspect, 4000-6000 feet, R006XY203WA - Cool Stony 16-24 PZ, R006XY702WA - Mountain Park, R006XY701WA - Mountain Shallow. ... R006XY126WA – Stony South Aspect 4000-6000 feet

4) Site occurs approximately at 6,000 to 7,600 feet elevation; cryic temperature regime. Sites include: ESG R006XY165WA - Stony south aspect, 6000-7600 feet, R006XY703WA - High Mountain Park, R006XY704WA - Subalpine Park. ... R006XY165WA – Stony South Aspect 6000-7600 feet

c. Soil is deeper than 20 inches to restrictive horizon and has less than 35 percent rock fragments.

1) Site has northerly aspect. Site include: ESG R006XY450WA - North aspect, Prairie, R006XY103WA - Cool Loamy 16-24 PZ. ... R006XY450WA – North Aspect Prairie

2) Site not as above. Sites include: ESG R006XY430WA - Loamy, prairie, R006XY102WA - Loamy 16-24 PZ. ... R006XY430WA – Loamy Prairie

2 The site occurs on depressions, swales on flood plains or terraces.

i. Soils are hydric and saturated to the surface. ... R006XB100OR – Wet Meadow

ii. Soil are non-hydric and not saturated to the surface, but plants are water tolerant.

b. Site elevation is approximately 4,000 to 6,000 feet; frigid temperature regime. ... R006XB102OR – Cold Wet Meadow

c. Site elevation is approximately 6,000 to 7,600 feet; cryic temperature regime. ... F006XY706OR – Cryic Coniferous Flood Plain

MLRA 6 - South of the Columbia River

II. Resides south of Columbia River.

A. Soils mantled with thick coarse pumice and ash, Cryic soil temperature regime.

1 Aquic soil moisture regime or water table within 60" of the soil surface -

2 Xeric soil moisture regime, no water table within 60" of soil surface -

B. Not as above.

1 Meadow or riparian site -

2 Forest or upland site.

i. Xeric soil moisture regime.

a. Site occurring in northern Oregon within the Eastern Columbia Gorge maritime micro climate -

b. Site occurring south of the Eastern Columbia Gorge micro climate -

ii. Not as above.

a. Aridic soil moisture regime -

b. Udic soil moisture regime (see MLRA 003X for relevant sites).

LRU A (Oregon): Cascade Mountains, Eastern Slope - Oak-Conifer Foothills

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I. Mean annual precipitation less than 20" (East of Hood river valley, below ~ 2,000 ft elevation, increasing to ~ 2,500 ft from Dufur south)

A. Soil surface texture clay loam or clay, (> 35% clay, found only toward the southern extent of east gorge Oregon white oak in and around the Warm Springs Reservation) ... R006XA310OR – Juniper-Oak Clayey

B. Soil surface texture courser than above (typically loam, silt loam or fine sandy loam, < 35% clay)

1 Slope < 15 %, (soils deep to very deep) ... R006XA300OR – Loamy 14-20 PZ

2 Slope > 15 %, (soils shallow to deep)

i. Sites found on south and west aspects ... R006XA200OR – South Slopes 14-20 PZ

ii. Sites found on north and east aspects ... R006XA202OR – North Slopes 14-20 PZ

II. Mean annual precipitation 20" or greater, location not as above

A. Soils shallow (10 - 20"), occupying exposed areas such as summits, ridgetops, balds and southerly slopes ... R006XA204OR – South Slopes 20-40 PZ

B. Not as above

2 Site within, or just west of, the maritime zone defined by the Hood River and White Salmon Valleys

i. Elevation greater than 2,500 ft, soil temperature regime Frigid ... F006XA803OR – Frigid Xeric Maritime North Slopes 35-55 PZ

ii. Elevation between 1,500 ft and 2,500 ft

a. Slope > 30%

1) Occupying north and east aspects ... F006XA803OR – Frigid Xeric Maritime North Slopes 35-55 PZ

2) Occupying south and west aspects ... R006XA302OR – Steep South Slopes 20-40 PZ

b. Slope < 30% ... F006XA804OR – Mesic Xeric Maritime Foothills 30-50 PZ

iii. Elevation below 1,500 ft (all of the 20 - 40 PZ ecological sites occur in this elevation zone so distinction will be more challenging here, clueing into biotic characteristics may be more helpful if soil pits are not feasible)

a. Slope > 45%

1) Soils moderately deep, 20 – 40", (aspects generally south or west) ... R006XA302OR – Steep South Slopes 20-40 PZ

2) Soils deep, 40 – 60", (uncommon on these steeper slopes) ... R006XA304OR – Loamy 20-40 PZ

3) Soils very deep, 60" + , (uncommon on these steeper slopes) ... F006XA804OR – Mesic Xeric Maritime Foothills 30-50 PZ

b. Slope < 45%

1) Slope > 30%, on south and west aspects ... R006XA302OR – Steep South Slopes 20-40 PZ

2) Not as above

a) Soils deep, 40 – 60", (occasionally moderately deep) ... R006XA304OR – Loamy 20-40 PZ

b) Soils very deep, 60" + ... F006XA804OR – Mesic Xeric Maritime Foothills 30-50 PZ

1 Site East of the maritime zone described above

i. Mean annual precipitation 20 – 30", (elevation ~ 2,000 - 3,000 ft, increasing to ~ 2,500 – 3,500 ft south of Dufur)

a. Slopes > 30%, on south and west aspects ... R006XA302OR – Steep South Slopes 20-40 PZ

b. Not as above ... R006XA304OR – Loamy 20-40 PZ

ii. Mean annual precipitation greater than 30", (elevation above ~ 3,000 ft, increasing to ~ 3,500 ft south of Dufur)

a. Slope > 30%

1) Occupying north and east aspects ... F006XA803OR – Frigid Xeric Maritime North Slopes 35-55 PZ

2) Occupying south and west aspects ... R006XA302OR – Steep South Slopes 20-40 PZ

b. Slope < 30% ... F006XA804OR – Mesic Xeric Maritime Foothills 30-50 PZ

LRU B (Oregon): Cascade Mountains, Eastern Slope – Ponderosa Pine Foothills

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I. Soil temperature regime mesic

A. Site primarily found on north or south aspects

1 Site primarily found on north aspects ... F006XB802OR – Mesic Xeric North Slopes 15-25 PZ

2 Site primarily found on south aspects ... R006XB208OR – Shallow Slopes 14-20 PZ

B. Site found on all aspects

1 Soils shallow or very shallow (? 20")

i. Soils very shallow

ii. Soils shallow ... R006XA308OR – Moist Scabland 14-18 PZ

2 Soils moderately deep to very deep (> 20")

i. Mean annual precipitation 14 - 20" ... F006XY710OR – Mesic Xeric Foothills 14-20 PZ

ii. Mean annual precipitation 20 - 25" ... F006XY709OR – Mesic Xeric Foothills 20-25 PZ

II. Soil temperature regime frigid

A. Mean annual precipitation less than 20"

1 Soils moderately deep to very deep (20" +), abundant fine fuels, frequent surface fires common ... AX006X03B101 – Oregon East Cascades, Outwash Plains and Volcanic Uplands (Ponderosa pine / Antelope bitterbrush / Idaho Fescue) 14-18 PZ

2 Soils shallow to moderately deep (10 - 40"), fine fuels limit fire regime to moderately frequent surface and mixed fires ... AX006X03B100 – Oregon East Cascades, Lava Plains (Ponderosa pine - Western Juniper) 12-16 PZ

B. Mean annual precipitation equal to or greater than 20"

1 Mean annual precipitation 20 - 30", shade tolerant conifers uncommon in understory ... AX006X03C105 – Oregon East Cascades, Volcanic Uplands and Mountainbases (Ponderosa pine - Douglas-fir - (Grand fir) / Snowbrush) 20-30 PZ

2 Mean annual precipitation 30 - 40", shade tolerant conifers common in understory ... AX006X04C100 – East Cascades, Mid-Elevation Glaciated Mountainflanks (Douglas-fir - Ponderosa pine - Grand fir / Giant Chinquapin) 30-40 PZ

LRU C (Oregon): Cascade Mountains, Eastern Slope - Pumice Plateau Forest

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I. Sites concentrated around the east flanks of Crater lake

A. Site occupying south aspects on buttes ... F006XY701OR – East Crater Lake Pumice Buttes

B. Not as above

1 Site occupying high elevation stratovolcano slopes ... F006XY707OR – East Crater Lake Stratovolcano Slopes

2 Site occupying ash flows or alluvial fans

i. Slopes flat to gentle, occupying low landscape positions in basins and drainages

a. Soils excessively drained ... F006XY702OR – East Crater Lake Pumice Drainages

b. Soils somewhat excessively drained ... F006XY704OR – East Crater Lake Pumice Basins

ii. Not as above

a. Site found on all aspects ... F006XY703OR – East Crater Lake Gentle Pumice Slopes

b. Site found primarily on north or south aspects

1) Site primarily found on south aspects ... F006XY700OR – East Crater Lake Pumice South Slopes

2) Site primarily found on moderate to steep north aspects ... F006XY705OR – East Crater Lake Steep North Slopes

II. Not as above

A. Mean annual precipitation 20 - 40", slopes gentle to steep ... AX006X01F100 – Pumice Plateau, Volcanic Uplands and Mountainbases (Ponderosa Pine / Greenleaf manzanita - Snowbrush) 20-30 PZ

B. Mean annual precipitation 18 - 25", slopes flat to gentle

1 Slopes nearly flat, site occupying low landscape positions ... AX006X01F102 – Pumice Plateau, Flats and Frost Pockets (Lodgepole Pine / Antelope bitterbrush) 18-25 PZ

2 Slopes gentle to moderate, site occupying upslope landscape positions ... AX006X01F101 – Pumice Plateau, Volcanic Uplands (Ponderosa Pine / Antelope bitterbrush) 18-25 PZ

LRU D (Oregon): Cascade Mountains, Eastern Slope – Lost Forest

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I. Sites occupying hills, basins and lakebed terraces

A. Soils very shallow to shallow (0-20") ... R006XA217OR – Very Shallow Pumice Terrace 8-11 PZ

B. Not as above

1 Soils moderately deep (20-40") ... R006XA213OR – Pumice Terrace 8-10 PZ

2 Soils deep to very deep (40"+) ... R006XA212OR – Forested Sandy Loam 8-11 PZ

II. Sites occupying dunes

A. Elevation less than 4400 ft

1 **Frost free days 85-95** ... R006XA214OR – Forested Pumice Dunes 8-11 PZ

2 **Frost free days 45-55** ... R006XA219OR – Juniper Dunes 8-10 PZ

B. Elevation 4400 ft or greater

1 **Soils deep (40-60"), slopes gentle to moderate (15-35%)** ... R006XA218OR – Juniper Sandy Slopes 8-11 PZ

2 **Soils very deep (60"+), slopes gentle (2-20%)** ... R006XA216OR – Forested Shrubby Dunes 8-11 PZ

LRU E (Oregon): Cascade Mountains, Eastern Slope - Pumice Plateau Basins

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I. Forested site

A. Occurring on various soil types, loamy sand, sandy loam, peat, muck ... AX006X02F100 – Pumice Plateau Wet Basins (Lodgepole Pine - Douglas Spirea)

II. Meadow or marsh site

A. Soils moderately well drained

1 **Semi-impermeable layer at 20" deep, restricts some root activity** ... R006XB010OR – Meadow Fan 14-26 PZ

2 **Not as above** ... R006XB011OR – Meadow Knoll 14-26 PZ

B. Soils somewhat poorly drained

1 **Ponding rare, clayey soils** ... R006XB009OR – Wet Pumice Terrace 14-26 PZ

2 **Ponding frequent, loamy soils** ... R006XB012OR – Dry Pumice Meadow 14-26 PZ

C. Soils poorly drained

1 **Water table below the effective rooting depth for part of the growing season** ... R006XB013OR – Wet Pumice Meadow 14-26 PZ

2 **Water table at or near the surface for most of the year**

i. **Soil surface dry by late in the growing season** ... R006XB014OR – Meadow Swale 14-26 PZ

ii. **Soil surface moist year round** ... R006XB016OR – Wet Marsh 14-26 PZ

iii. **Transitional site between Meadow Swale 14-26 PZ and Wet Marsh 14-26 PZ, no known abiotic differences** ... R006XB015OR – Marshy Swale 14-26 PZ

LRU G (Oregon): Cascade Mountains, Eastern Slope – Riparian and Meadow sites

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I. Frigid temperature regime, elevations between 2,800 and 3,500 ft ... R006XB100OR – Wet Meadow

II. Cryic temperature regime, elevations above 3,500 ft

A. Site occurring on floodplains and low stream terraces ... F006XY706OR – Cryic Coniferous Flood Plain

B. Not as above

1 Site does not experience spring ponding, water table 12 - 24"

2 Site experiences spring ponding

i. Site occurs largely in the Deschutes basin, willow dominated ... R006XB102OR – Cold Wet Meadow

ii. Site occurs largely in the Klamath and Great basins, California larkspur dominated, see MLRA 21 Wet Meadow 14-40 PZ site