Major Land Resource Area 006X
Cascade Mountains, Eastern Slope

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Description

Stretching from northern Washington to southern Oregon, the Cascade Mountains, Eastern Slope, spans the entirety of the mountain slopes, foothills, elevated plateaus and valleys on the eastern slopes of the Cascade mountains. This MLRA is a transitional area between the Cascade Mountains to the west and the lower lying Columbia Basalt Plateau to the east. Situated in the rainshadow of the Cascade Crest, this MLRA receives less precipitation than portions of the cascades further west and greater precipitation than the basalt plateaus to the east. Geologically, the majority of the MLRA is dominated by Miocene volcanic rocks while the northern portion is dominated by Pre-Cretaceous metamorphic rocks and the southern portion is blanketed with a thick mantle of ash and pumice from Mount Mazama. The soils in the MLRA dominantly have a mesic, frigid, or cryic soil temperature regime, a xeric soil moisture regime, and mixed or glassy mineralogy. They generally are moderately deep to very deep, well drained, and loamy or ashy. Biologically, the MLRA is dominated by coniferous forest, large expanses of which are dominated by ponderosa pine, Douglas-fir or lodgepole pine. Areas experiencing cooler and moister conditions include grand fir, white fir, and western larch while the highest elevations include pacific silver fir, subalpine fir and whitebark pine. Economically, timber harvest and recreation are important land uses in these forest. Historically, many of these forests would have experienced relatively frequent, low and mixed severity fire favoring the development of mature forests dominated by ponderosa pine or Douglas-fir. In the southern pumice plateau forests, less frequent, higher severity fire was common and promoted the growth of large expanses of even-aged, lodgepole forests. Further information for this MLRA is available online in the USDA publication "Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin", accessible below.

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 - ... Key 7 – LRU E (Oregon): Cascade Mountains, Eastern Slope - Pumice Plateau Basins

2 Xeric soil moisture regime, no water table within 60" of soil surface - ... Key 5 – LRU C (Oregon): Cascade Mountains, Eastern Slope - Pumice Plateau Forest

B. Not as above.

1 Meadow or riparian site - ... Key 8 – LRU G (Oregon): Cascade Mountains, Eastern Slope – Riparian and Meadow sites

2 Forest or upland site.

i. Xeric soil moisture regime.

a. Site occurring in northern Oregon within the Eastern Columbia Gorge maritime micro climate - ... Key 3 – LRU A (Oregon): Cascade Mountains, Eastern Slope - Oak-Conifer Foothills

b. Site occurring south of the Eastern Columbia Gorge micro climate - ... Key 4 – LRU B (Oregon): Cascade Mountains, Eastern Slope – Ponderosa Pine Foothills

ii. Not as above.

a. Aridic soil moisture regime - ... Key 6 – LRU D (Oregon): Cascade Mountains, Eastern Slope – Lost Forest

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

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

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

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 ... F006XY708OR – Frigid Xeric Foothills 12-20 PZ

2 Soils shallow to moderately deep (10 - 40"), fine fuels limit fire regime to moderately frequent surface and mixed fires ... R006XB002OR – Frigid Xeric Lava Plains 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 ... F006XB800OR –

Frigid Xeric Foothills 20-30 PZ

2 Mean annual precipitation 30 - 40", shade tolerant conifers common in understory ... F006XB801OR – Frigid Xeric Foothills 30-40 PZ

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

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 ... F006XY714OR – Cryic Xeric Pumice Slopes 20-40 PZ

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

1 Slopes nearly flat, site occupying low landscape positions ... F006XY718OR – Cryic Xeric Pumice Basins 18-25 PZ

2 Slopes gentle to moderate, site occupying upslope landscape positions ... F006XY712OR – Cryic Xeric Pumice Uplands 18-25 PZ

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

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

I. Forested site

A. Occurring on various soil types, loamy sand, sandy loam, peat, muck ... F006XE807OR – Cryic Aquic Pumice Basins (PICO/SPDO-VAUL)

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

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