

East Cascades Oregon White Oak ESD Key and Summaries

Background and Instructions:

NRCS ecologists are in the process of updating NRCS “Ecological Site Descriptions” (ESDs) for Oregon white oak systems in the East Cascades. Ecological Site Descriptions provide a consistent framework for classifying and describing soils and vegetation, allowing people to delineate areas that share similar responses to management activities or disturbances. The ESDs provide a great source of information to contemplate historical condition and natural range of variability.

While using the ESD key, you’ll be asked questions about mean annual precipitation (look up ahead of time using PRISM website or LandPKS app), slope, aspect, soil texture, and soil depth. You can pack a small hand shovel and a water bottle to assist with answering soil questions. Refer to soil texture guide at the end of this document. If you skip the soil texturing step, your results may be less accurate.

Advance through the key until you end up with an Ecological Site ID. Read the summary description and click on the hyperlink, if there is one, to review the full text ESD.

Ecological Site Key:

1. Site occupies stream or river terrace or floodplain ... [R006XA206OR – Riparian terrace](#)
2. Mean annual precipitation less than 20", location not as above
 - a. Soil surface texture is clay loam or clay, (> 35% clay, found only toward the southern extent of eastern gorge Oregon White Oak in and around the Warm Springs Reservation ... [R006XA310OR – Juniper-Oak Clayey](#)
 - b. Soil surface texture coarser than above (typically loam, silt loam or fine sandy loam, < 35% clay)
 - i. Soils shallow (10 – 20"), occupying exposed areas such as summits, shoulders, ridgetops, balds, convex hills, or southerly slopes >45%, often with cobbly or stony surfaces
 1. Soils loamy-skeletal (meaning high rock fragment content), herbaceous dominated, oak absent to very sparse ... [R006XA204OR – South Slopes 20-40 PZ \(name will change to R006XA204OR – Shallow Droughty 14-40 PZ\)](#)
 2. Soils loamy, oak common but may be krummholz or otherwise stunted... [R006XA205OR – Shallow 14-40 PZ](#)
 - ii. Soils deeper than above (20"+)
 1. Slope < 15 %
 - a. Soils deep to very deep (40 – 60" +), often on flatter areas with productive understory and ponderosa pine typically abundant ... [R006XA300OR – Loamy 14-20 PZ](#)
 - b. Soils moderately deep (20 – 40"), ponderosa pine typically limited and more oak dominated than above ... [R006XA200OR – South Slopes 14-20 PZ](#)
 2. Slope > 15 %

- a. Sites found on S and W aspects ... [R006XA200OR – South Slopes 14-20 PZ](#)
 - b. Sites found on N and E aspects
 - i. Soils moderately deep (20 – 40”), Douglas-fir typically limited... [R006XA202OR – North Slopes 14-20 PZ](#)
 - ii. Soils deep to very deep (40 – 60” +), Douglas-fir common, ... [R006XA304OR – Loamy 20-40 PZ](#)
3. Mean annual precipitation 20" or greater, location not as above
 - a. Soils shallow (10 – 20”), occupying exposed areas such as summits, shoulders, ridgetops, balds, convex hills, or southerly slopes >45%, often with cobbly or stony surfaces
 - i. Soils loamy-skeletal (meaning high rock fragment content), herbaceous dominated, oak absent to very sparse ... [R006XA204OR – South Slopes 20-40 PZ \(name will change to R006XA204OR – Shallow Droughty 14-40 PZ\)](#)
 - ii. Soils loamy, oak common but may be krummholz or otherwise stunted... [R006XA205OR – Shallow 14-40 PZ](#)
 - b. Soils moderately deep to very deep (20 – 60” +)
 - i. Slope > 30 %, occupying S and W aspects ... [R006XA302OR – Steep South Slopes 20-40 PZ](#)
 - ii. Not as above
 1. Site within, or just west of, the maritime zone defined by the Hood River and White Salmon Valleys
 - a. Elevation greater than 2,500 ft, (> 40” MAP) ... [F006XA803OR – Frigid Xeric Maritime North Slopes 35-55 PZ](#)
 - b. Elevation between 1,500 ft and 2,500 ft (30 – 40” MAP)
 - i. Slope > 30 %, occupying N and E aspects ... [F006XA803OR – Frigid Xeric Maritime North Slopes 35-55 PZ](#)
 - ii. Not as above ... [F006XA804OR – Mesic Xeric Maritime Foothills 30-50 PZ](#)
 - c. Elevation below 1,500 ft (~30” MAP)
 - i. Soils moderately deep to deep, 20 – 60” ... [R006XA304OR – Loamy 20-40 PZ](#)
 - ii. Soils very deep, 60” +, typically formed in alluvium or glacial deposits ... [F006XA804OR – Mesic Xeric Maritime Foothills 30-50 PZ](#)
 2. Site east of the maritime zone described above
 - a. Mean annual precipitation 20 – 30” (elevation ~ 2,000 – 3,000 ft, increasing to ~ 2,500 – 3,500 ft south of Dufur)
 - i. Slope 15 – 30% slopes on S and W aspects ... [R006XA200OR – South Slopes 14-20 PZ](#)
 - ii. Not as above ... [R006XA304OR – Loamy 20-40 PZ](#)
 - b. Mean annual precipitation greater than 30” (elevation above ~ 3,000 ft, increasing to ~ 3,500 ft south of Dufur)
 1. Slope > 30 %, occupying N and E aspects ... [F006XA803OR – Frigid Xeric Maritime North Slopes 35-55 PZ](#)

2. Not as above ... [F006XA804OR – Mesic Xeric Maritime Foothills 30-50 PZ](#)

Summary of Oregon White Oak ESDs

Ecological Site Concepts for LRU A (Oregon): Cascade Mountains, Eastern Slope – Oak-Conifer Foothills

[R006XA310OR – Juniper-Oak Clayey](#)

- **Extent:** Limited in extent; occurs on or near the Warm Springs Reservation below 3,500 ft
- **Topography:** Gentle to moderately sloping benches and side slopes of foothills
- **Slope:** Range from nearly level to 50%
- **Elevation:** Range from 2,000-3,500 ft
- **Aspect:** This site occurs on all aspects
- **Mean annual precipitation:** 14 – 20"
- **Soils:** Moderately deep, well drained and fine (clay) textured; may occur on shallower soils; surface textures are typically gravelly silty clay loam or gravelly clay
- **Reference plant community:** Open, savannah-like woodland dominated by white oak and western juniper. Ponderosa pine is common to a lesser extent in the overstory and pine reproduction may be sporadic in the openings. Most common grasses are Idaho fescue and bluebunch wheatgrass. A variety of perennial forbs occur throughout the stand such as lupine, lomatium, balsamroot, common yarrow, groundsel, and agoseris. Bitterbrush, serviceberry, snowberry, and buckwheat are prominent shrubs and subshrubs.

[R006XA300OR – Loamy 14-20 PZ](#)

- **Extent:** Large; typically occurs east of the Hood River valley below 3,000 ft
- **Topography:** Broad summits, shoulders, plateaus, and gentle side slopes
- **Slope:** Gentle slopes, range from 2 to 20 percent, typically less than 15%
- **Elevation:** Typically ranges from 1,000 to 2,500 feet but may occur as low as 250 feet
- **Aspect:** This site occurs on all aspects
- **Mean annual precipitation:** 14 – 20"
- **Soils:** Deep to very deep, productive soils with high water holding capacity
- **Reference plant community:** Oregon white oak and ponderosa pine are the dominant trees. Idaho fescue is the most common grass, followed by bluebunch wheatgrass, Sandberg bluegrass, and prairie junegrass. Flowering plants include arrowleaf balsamroot, common yarrow, pea, and lupine. Antelope bitterbrush is the most likely shrub species but may be scattered.

[R006XA200OR – South Slopes 14-20 PZ](#)

- **Extent:** Large; occurs East of the Hood River valley below ~ 3,000 ft
- **Topography:** Hill and mountain side slopes
- **Slope:** Moderate to steep southerly slopes; typically greater than 15%
- **Elevation:** Typically ranges from 1,000 to 2,500 feet but may extend from 500 to 3,500 feet
- **Aspect:** South, southeasterly, or west facing exposures
- **Mean annual precipitation:** 14 – 20"

- **Soils:** Variable but often droughty (low water holding capacity) with a cobbly soil surface and subsurface
- **Reference plant community:** Oregon white oak with minor ponderosa pine are the most common trees. Grasses include bluebunch wheatgrass and Sandberg's bluegrass, with minor Idaho fescue. Common flowering plants are arrowleaf balsamroot and yarrow. Common shrubs include antelope bitterbrush, rubber rabbitbrush, and deerbrush.

R006XA202OR – North Slopes 14-20 PZ

- **Extent:** Moderate; occurs East of the Hood River valley below ~ 2,500 ft
- **Topography:** North facing backslopes
- **Slope:** Moderate to steep northerly slopes, typically greater than 30 %, ranges from 30-70%
- **Elevation:** Typically ranges from 1,000-1,700 feet but may extend up to 3,000 feet
- **Aspect:** North, northwesterly, northeasterly, or east facing exposures
- **Mean annual precipitation:** 14 – 20"
- **Soils:** Typically moderately deep and well drained; surface textures are often stony loam and subsoil textures are commonly loam or cobbly loam
- **Reference plant community:** Trees include Oregon white oak and occasional ponderosa pine. Grasses include Idaho fescue, bluebunch wheatgrass, and minor Sandberg bluegrass. Flowering plants include yarrow, pea, lupine, and Scouler's woollyweed. Deerbrush and antelope bitterbrush are the most common shrubs.

R006XA205OR – Shallow 14-40 PZ (new proposed ES- full ESD not written yet)

- **Extent:** Limited; occurs throughout the Oregon white oak zone
- **Topography:** Exposed areas such as summits, ridgetops, and southerly slopes
- **Slope:** Range from 0 to 75%
- **Elevation:** Typically 500 to 2500 feet but may range from 250 to 3,000 feet
- **Aspect:** This site occurs on all aspects
- **Mean annual precipitation:** Variable, 14-40"
- **Soils:** Shallow, loamy soils with low to moderate water holding capacity, often cobbly soil surface
- **Reference plant community:** Vegetation typified stunted by shrubby or krummholz Oregon White Oak; perennial grasses, predominately Idaho fescue with lesser amounts of prairie junegrass and bluebunch wheatgrass; a diverse forb component that includes balsamroot, bighead clover, desert parsley, and lupine, and a variable subshrub and shrub component.

R006XA302OR – Steep South Slopes 20-40 PZ

- **Extent:** Limited, occurs within the Columbia River Gorge and above 2,000 ft outside of the Gorge
- **Topography:** Occurs on steep backslopes and in mountainous areas
- **Slope:** Range from 20-75%; typically greater than 30%
- **Elevation:** Range from 750-2,500 ft
- **Aspect:** Typically SE, S, SW
- **Mean annual precipitation:** 20-40"
- **Soils:** Moderately deep soils with moderate water holding capacity; surface horizon textures often range from loam, silt loam, fine sandy loam, or cobbly loam
- **Reference plant community:** Overstory typified by Oregon White Oak and Ponderosa Pine; primary grasses are Idaho fescue and bluebunch wheatgrass; common forbs are balsamroot, common yarrow, fleabane, and lupine; most common shrubs are bitterbrush and deerbrush.

R006XA304OR – Loamy 20-40 PZ

- **Extent:** Moderate; occurs within the Columbia River Gorge and above 2,000 ft outside of the Gorge
- **Topography:** Broad ridgetops, shoulders, structural benches, mountain backslopes
- **Slope:** Variable slopes, ranges from 5-70%
- **Elevation:** Ranges from 1,200-3,000 feet
- **Aspect:** This site occurs on all aspects
- **Mean annual precipitation:** 20-40” but may occur on northerly slopes below this precipitation zone
- **Soils:** Deep, productive soils with high water holding capacity; surface layer is a loam, silt loam, or cobbly loam
- **Reference plant community:** Likely trees include ponderosa pine and/or Douglas-fir, with variable Oregon white oak depending on conifer encroachment. Geyer’s sedge is often the most common graminoid but also Idaho fescue, blue wildrye, western fescue, and pinegrass. This site hosts a wide range of forbs including lupine, Scouler’s woollyweed, strawberry, pea, yarrow, big deervetch and others. Common snowberry and redstem ceanothus are the most common shrubs but Oregon grape and antelope bitterbrush may also occur.

R006XA206OR – Riparian terrace (new proposed ES- full ESD not written yet)

- **Extent:** Limited; occurs on floodplains and terraces of streams and rivers within and outside of the Columbia River Gorge
- **Topography:** Floodplains and terraces
- **Slope:** 0 – 5%
- **Elevation:** 250 – 3000 ft (still refining the full range)
- **Aspect:** This site occurs on all aspects
- **Mean annual precipitation:** Still refining the full range
- **Soils:** Alluvial soils, may be coarse textured and contain substantial stones, cobbles, and gravels
- **Reference plant community:** Productive sites with moist indicator herbaceous and shrub species present. Overstory includes Oregon White Oak with variability in other hardwoods such as black cottonwood and alder as well as conifers such as ponderosa pine, Douglas-fir and grand fir. Most common grass is blue wildrye. Common shrubs include snowberry and beaked hazelnut.

Ecological sites with no oak or very minor oak:

R006XA204OR – South Slopes 20-40 PZ (name will change to R006XA204OR – Shallow Droughty 14-40 PZ)

- **Extent:** Limited but occurs throughout the Oregon white oak zone; oak absent or very sparse, primarily herbaceous dominated
- **Topography:** Exposed areas such as summits, ridgetops, or southerly slopes
- **Slope:** 0 to 75%
- **Elevation:** Typically 500 to 2500 feet but may range from 250 to 3000 feet
- **Aspect:** This site occurs on all aspects
- **Mean annual precipitation:** 14-40”
- **Soils:** Very shallow to shallow, skeletal soils (high rock fragment content), droughty soils (low water holding capacity), often with a cobbly soil surface and subsurface
- **Reference plant community:** Vegetation typified by perennial grasses, predominately Idaho fescue with a lesser component of bluebunch wheatgrass and Sandberg bluegrass; a diverse forb

component that includes balsamroot, bighead clover, desert parsley, and lupine, and a variable subshrub and shrub component.

F006XA804OR – Mesic Xeric Maritime Foothills 30-50 PZ

- **Extent:** Large; occurring within the stronger maritime influence within the Hood River valley and elevations above 3,000 ft to the east of this zone
- **Topography:** Hillslopes, terraces, benches and mountain slopes
- **Slope:** Most often 4-60% but can range from 0-75%
- **Elevation:** Typically 100 to 2,500 ft, but can occur up to 3,600 ft
- **Aspect:** Variable
- **Mean annual precipitation:** 30-50"
- **Soils:** Deep to very deep, productive soils with high water holding capacity; surface textures are commonly loams and silt loams
- **Reference plant community:** Canopy composed of Douglas fir and ponderosa pine. Within the range of this site, lower, warmer elevations with longer growing seasons may host bigleaf maple in the sub-canopy, while higher elevations with greater effective moisture may host some grand fir. Western red cedar (*Thuja plicata*), and western larch (*Larix occidentalis*) may also occur occasionally in the stand. Minor Oregon White oak may occur as a seral species or in canopy gaps. Understory shrubs are diverse and may include snowberry, golden chinkapin, oceanspray, and pacific dogwood. Herbaceous cover is highly variable depending on shrub cover and canopy closure, common members are Columbia brome, elk sedge and woods strawberry.

F006XA803OR – Frigid Xeric Maritime North Slopes 35-55 PZ

- **Extent:** Moderate; occurring within the stronger maritime influence within the Hood River valley and elevations above 3,000 ft to the east of this zone
- **Topography:** Hillslopes, benches and mountain slopes
- **Slope:** Can range from 0-70% but typically greater than 15%
- **Elevation:** Commonly occupies elevations between 1,750-3,500 ft but may be occur from 1,100-4,000 ft
- **Aspect:** North and east
- **Mean annual precipitation:** 35-55"
- **Soils:** Moderately deep to very deep and well drained; surface textures are typically gravelly loams
- **Reference plant community:** Canopy dominated by Douglas-fir and grand fir with a diverse shrub understory. Ponderosa pine is also common and Western red cedar, western hemlock and western larch may occur in the stand in minor amounts. Understory shrubs are diverse and may include vine maple, serviceberry, oceanspray and California hazel. Herbaceous cover is highly variable depending on shrub cover and canopy closure; a diverse community may be present but common members are vanilla leaf, starflower, pinegrass and western fescue.