Ecological site F002XN903WA
Western redcedar - Douglas-fir/salal/swordfern

Last updated: 11/27/2024
Accessed: 09/22/2026

General information

Provisional. A provisional ecological site description has undergone quality control and quality assurance review. It contains a working state and transition model and enough information to identify the ecological site.

Classification relationships

Related to plant associations PSME-THPL-(ABGR)/GASH, PSME-THPL/GASH-MANE/POMU, THPL-ABGR/POMU in Chappell, C.B. 2006. Upland plant associations of the Puget Trough ecoregion, Washington. Natural Heritage Rep. 2006-01. Washington Department of Natural Resources, Natural Heritage Program, Olympia , Wash. [http://www.dnr.wa.gov/nhp/refdesk/communities/pdf/intro.pdf].

Table 1. Dominant plant species

Tree	(1) *Thuja plicata* (2) *Pseudotsuga menziesii*
Shrub	(1) *Gaultheria shallon*
Herbaceous	(1) *Polystichum munitum*

Physiographic features

Table 2. Representative physiographic features

Landforms	(1) Hill (2) Mountain slope (3) Valley
Flooding frequency	None
Ponding duration	Brief (2 to 7 days) to long (7 to 30 days)
Ponding frequency	None to frequent
Elevation	0 − 730 m
Slope	10 − 80 %

Ponding depth	0 – 20 cm
Water table depth	20 cm
Aspect	N, E, NW

Climatic features

The climate for this site is characterized by warm dry summers and mild moist winters. Precipitation is received mostly in the early fall to late winter.

Table 3 Representative climatic features

Frost-free period (average)	240 days
Freeze-free period (average)	
Precipitation total (average)	1,020 mm

Influencing water features

Soil features

Applicable soil series:
Alderwood warm, Aquic Dystroxerepts, Coveland, Deadmanbay, Doebay moist, Everett warm, Indianola warm, Mitchellbay, Morancreek, Sholander

Table 4. Representative soil features

Surface texture	(1) Gravelly sandy loam (2) Loamy sand (3) Silt loam
Drainage class	Somewhat poorly drained to somewhat excessively drained
Permeability class	Very slow to rapid
Soil depth	50 cm
Available water capacity (0-101.6cm)	6.35 – 18.54 cm

Soil reaction (1:1 water) (0-101.6cm)	4.5 – 10

Ecological dynamics

These sites are found in the rainshadow of the Olympic Mountains in the Puget Trough, on somewhat moist to moist soils. Western redcedar is the dominant overstory species for these sites, with a varying amount (to 50%) of Douglas-fir. Grand fir, red alder, western hemlock, lodgepole pine and big-leaf maple may be present but only as minority components. The historic fire regime would have been one of low frequency (150-300+ years) and moderate to high intensity. These fires would, in effect, be stand-replacing although individual trees would survive, providing a seed source. The heavy shade of a redcedar forest favors the gradual replacement of Douglas-fir with more shade tolerant redcedar in the absence of a major disturbance. The most common natural disturbances on these sites are small pockets of wind-thrown or diseased overstory trees. The resulting openings in the canopy allow some sunlight to reach the forest floor, which benefits the often sparse understory. This is especially true in mid-successional (75-150 years) stands, which have very little height differentiation. Western swordfern is frequently the most common understory species; salal, baldhip rose, snowberry, dull Oregongrape and stinging nettle are also regularly found on these sites. Most of these sites have been harvested for timber since European settlement although all of the various plant communities may have remnant mature trees.

State and transition model

Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Table 6. Community 1.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Table 7. Community 1.3 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Table 8. Community 1.4 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Table 9. Community 1.5 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Table 10. Community 1.6 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Wood products

Site Index data, by species, derived from: Alnus rubra: Worthington, Norman P. ,Floyd A. Johnson, George R. Staebler, and William J. Lloyd. 1960. Normal yield tables for red alder. USDA, Forest Service. Pacific Northwest Forest and Range Experiment Station Research Paper No 36. USDA NRCS curve # 100. Pseudotsuga menziesii: King, James E. 1966. Site index curves for Douglas-fir in the Pacific Northwest . Weyerhaeuser Company, Forestry Research Center. Forestry Paper 8. USDA NRCS curve # 795. Thuja plicata: Kurucz, J.F. 1978. Preliminary, polymorphic site index curves for western redcedar – Thuja plicata Donn – in coastal British Columbia. MacMillan Bloedel Forest Research Note No. 3. USDA NRCS curve # 970. CMAI data, by species, derived from: Alnus rubra: Table 11 of Worthington, N.P., F.A. Johnson, G.R. Staebler and W. J. Lloyd. 1960. Normal Yield Tables for Red Alder. USDA For. Ser. Res. Paper 36, 3p., illus. Pacific Northwest Forest and Range Experiment Station, Portland, OR. Pseudotsuga menziesii: Chambers, C. Washington State Department of Natural Resources Technical Report #20.

Table 11. Representative site productivity

Common Name	Symbol	Site Index Low	Site Index High	CMAI Low	CMAI High	Age Of CMAI	Site Index Curve Code	Site Index Curve Basis	Citation

Douglas-fir	*PSME*	75	120	102	175	–	–	–	
red alder	*ALRU2*	85	105	92	127	–	–	–	
western redcedar	*THPL*	55	75	0	0	–	–	–	

Other references

Fire Effects Information System, [Online].
U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer).
http://www.fs.fed.us/database/feis/

Agee, J.K. Fire ecology of Pacific Northwest forests. Covelo, CA: Island Press; 1993. 493 pages .

Perry, D.A. Forest Ecosystems. Baltimore, MD: The Johns Hopkins University Press; 1994. 649 pages.

Contributors

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Approval

Kirt Walstad, 11/27/2024

Rangeland health reference sheet

Interpreting Indicators of Rangeland Health is a qualitative assessment protocol used to determine ecosystem condition based on benchmark characteristics described in the Reference Sheet. A suite of 17 (or more) indicators are typically considered in an assessment. The ecological site(s) representative of an assessment location must be known prior to applying the protocol and must be verified based on soils and climate. Current plant community cannot be used to identify the ecological site.

Author(s)/participant(s)	
Contact for lead author	
Date	11/27/2024
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:**

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2. **Presence of water flow patterns:**

3. **Number and height of erosional pedestals or terracettes:**

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):**

5. **Number of gullies and erosion associated with gullies:**

6. **Extent of wind scoured, blowouts and/or depositional areas:**

7. **Amount of litter movement (describe size and distance expected to travel):**

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):**

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):**

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):**

12. **Functional/Structural Groups (list in order of descending dominance by above-ground annual-production or live foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):**

    Dominant:

    Sub-dominant:

    Other:

    Additional:

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):**

14. **Average percent litter cover (%) and depth (in):**

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):**

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16. **Potential invasive (including noxious) species (native and non-native). List species which BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicators, we are describing what is NOT expected in the reference state for the ecological site:**

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17. **Perennial plant reproductive capability:**
