

Ecological site AX002X02X008

Portland Basin Riparian Forest

Last updated: 12/09/2024
Accessed: 08/26/2026

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.

MLRA notes

Major Land Resource Area (MLRA): 002X–Willamette and Puget Sound Valleys

The Willamette and Puget Sound Valleys Major Land Resource Area (MLRA 2) is in western parts of Washington and Oregon. It occupies a forearc basin between the Coast Ranges and the Cascade Mountain volcanic arc. The northern part contains Pleistocene drift, outwash, and lacustrine and glaciomarine deposits associated with continental glaciers. The southern part contains Late Pleistocene deposits from glacial outburst floods (Missoula Floods). Climate is mild and moist, and the growing season is long. Mean annual precipitation ranges from 20 to 60 inches, received mostly in fall, winter, and spring. Summers are dry. The soil temperature regime is mesic, and the soil moisture regimes are xeric and aquic. Most sites in this MLRA can support forested vegetation, but some were maintained as prairie, savanna, or woodland through cultural burning prior to Euro-American settlement. Puget Sound has a moderating effect on temperatures, and humidity can be higher in the northern part of the MLRA. Douglas-fir (*Pseudotsuga menziesii*) is widespread throughout. Oregon white oak (*Quercus garryana*) is common on uplands in the south and on warm, exposed or droughty sites in the north. Pacific madrone grows in areas close to saltwater. Western hemlock (*Tsuga heterophylla*) is codominant with Douglas-fir in the north. Flood plains typically contain Brayshaw black cottonwood (*Populus balsamifera* ssp. *trichocarpa*) and red alder (*Alnus rubra*). Oregon ash (*Fraxinus latifolia*) is typical of forested wetlands in the south. Forestry, urban development, and cultivated agriculture are currently the most extensive land uses (USDA, Agriculture Handbook 296, 2022).

LRU notes

The Portland Basin and Hills Land Resource Unit (LRU B) is in southwestern Washington and northwestern Oregon. The LRU extends north to the Cowlitz River and transitions to the Willamette Valley in the south. The Columbia River Gorge limits the eastern extent, and influence of tidewater at Cathlamet identifies the northwestern extent. Elevation ranges from sea level to about 2,000 feet. Major landforms include glaciofluvial terraces along the Columbia River, as well as residual hills and foothills surrounding the basin. Minor areas of Columbia River flood plain are present in Washington and more extensively in Oregon. Residual hills are composed primarily of Quaternary-Pliocene and Tertiary volcanic and sedimentary rocks. The lower-relief basin is composed primarily of sediment from catastrophic Quaternary glacial flooding from Glacial Lake Missoula. The Columbia River splits this LRU between Oregon and Washington. In Washington, mean annual precipitation ranges from 35 to 60 inches. Most falls as rain between October and May. The frost-free period ranges from 160 to 220 days. Locations near the Columbia River Gorge experience strong winds and infrequent ice storms with little winter snow. Average daily maximum temperatures in summer at Vancouver, Washington, are 1 to 3 degrees F warmer compared to Seattle or Olympia, Washington (Agricultural Climate Information System, 2007a, 2007b). Oregon white oak and Douglas-fir are common north of the Columbia River in Washington. Western redcedar and western hemlock grow in areas of higher moisture, at higher elevations, or on protected aspects.

Classification relationships

Relationship to Other Established Classifications: National Vegetation Classification Group: G851 North-Central Pacific Lowland Riparian Forest Group and A3743 Oregon Ash–Black cottonwood–Alder Riparian Forest Alliance Washington Department of Natural Resources, Ecological Systems of Washington State: North Pacific Lowland Riparian Forest and Shrubland

Ecological site concept

This ecological site is in riparian corridors on stream terraces and flood plain steps on alluvial soils. It is at lower elevations that have abundant precipitation. Summers are warm and moist. Winters are cool, wet, and have intermittent winter ice storms or rare snowfall that does not persist. Parent material is alluvium. The soils are typically subject to flooding from November to April. The smaller, more frequent flood events typically only cause minor scouring in comparison to greater-magnitude 100- to 500-year floods.

Associated sites

AX002X02X003	Portland Basin Bogs and Fens
AX002X02X007	Portland Basin Wet Forest
AX002X02X004	Portland Basin Forest

Similar sites

AX002X01X008	Puget Lowlands Riparian Forest
--------------	--------------------------------

Table 1. Dominant plant species

Tree	(1) <i>Populus balsamifera</i> ssp. <i>trichocarpa</i> (2) <i>Fraxinus latifolia</i>
Shrub	(1) <i>Salix</i>
Herbaceous	(1) <i>Polystichum munitum</i>

Legacy ID

F002XB008WA

Physiographic features

Table 2. Representative physiographic features

Landforms	(1) Terrace (2) Flood plain
Flooding duration	Brief (2 to 7 days) to very long (more than 30 days)
Flooding frequency	Occasional to frequent
Ponding duration	Brief (2 to 7 days)
Ponding frequency	None to frequent
Elevation	0 – 150 m

Slope	0 – 10 %
Ponding depth	0 – 10 cm
Aspect	W, NW, N, NE, E, SE, S, SW

Table 3. Representative physiographic features (actual ranges)

Flooding duration	Not specified
Flooding frequency	Not specified
Ponding duration	Not specified
Ponding frequency	Not specified
Elevation	0 – 460 m
Slope	0 – 20 %
Ponding depth	Not specified

Climatic features

Mean annual air temperature: 48 to 52 degrees Fahrenheit

Table 4 Representative climatic features

Frost-free period (characteristic range)	160-240 days
Freeze-free period (characteristic range)	
Precipitation total (characteristic range)	760-2,030 mm

Influencing water features

Soil features

Surface textures: Silt loams, loams, and silty clay loams

Soil family textures: Sandy, coarse-loamy, loamy-skeletal, and sandy-skeletal

Parent material: Alluvium

Soil depth: Greater than 60 inches

Soil drainage: Somewhat poorly drained to somewhat excessively drained

Available water capacity in the top 40 inches: 3 to 15 in/in

pH in water: 5.1 to 6.5

Ecological dynamics

Black cottonwood (*Populus balsamifera* spp. *trichocarpa*), Oregon ash (*Fraxinus latifolia*), and red alder (*Alnus rubra*) are the most common trees in the overstory. Other trees include bigleaf maple (*Acer macrophyllum*) and cascara (*Frangula purshiana*). Conifers, such as Douglas-fir (*Pseudotsuga menziesii*) and grand fir (*Abies grandis*), grow in some late seral sites and on some terraces.

Understory species diversity is greatest near the streams because erosion and deposition create small openings for pioneering species. Understory species include Sitka willow (*Salix sitchensis*), shining willow (*Salix lucida*), salmonberry (*Rubus spectabilis*), thimbleberry (*Rubus parviflorus*), elderberry (*Sambucus racemosa*), redosier dogwood (*Cornus sericea*), vine maple (*Acer circinatum*), and western swordfern (*Polystichum munitum*).

The most common natural disturbance is flooding. The volume and longevity of the flooding determine the effect on the dynamics of the forest. Although wildfire is uncommon in this ecological site, stand-replacing fires may occur at intervals of greater than 450 years. Fallen trees that have exposed root systems are common. The presence of large woody debris is also common.

This site can be compared to the Puget Lowlands Riparian Forest site in LRU A, which is similar but has lower summer temperatures and higher amounts of summer precipitation. Climate may be moister during the growing season in LRU A, leading to a shorter recovery between disturbances than in LRU B.

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 2.1 plant community composition

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

Table 9. Community 2.2 plant community composition

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

Table 10. Community 2.3 plant community composition

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

Other references

United States National Vegetation Classification. 2016. United States National Vegetation Classification Database, V2.0. Federal Geographic Data Committee, Vegetation Subcommittee, Washington, D.C. (accessed 11 October 2020).

Washington Department of Natural Resources, Natural Heritage Program. 2015. Ecological systems of Washington State. A guide to identification.

Contributors

Erik Dahlke
Marty Chaney

Approval

Kirt Walstad, 12/09/2024

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	12/09/2024
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. Number and extent of rills:

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):

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

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:

17. Perennial plant reproductive capability:
