Summary Table: Characteristics of Ecoregions of Western Washington and Oregon

1. COAST RANGE

Level IV Ecoregion	Physiography	Geology	Soil	Climate	Potential Natural Vegetation	Land Use and Land Cover
1a. Coastal Lowlands	Marine terraces, estuaries, sand dunes, and spits with low gradient, black water streams, wetlands, and rivers and shallow coastal lakes. Channelization and diking common.	Quaternary marine and non-marine estuary deposits, beach and dune sands; alluvium.	Spodosols (Haplorthods), Entisols (Fluvaquents), Inceptisols (Fluvaquents), Aquolls (Fluvaquolls), Mollisols (Argiaquolls)	Hydric, Udic, Aquic, Xeric, Mesic, Frigid, Cryic, Typic, Humic, Fluvaquentic, Haplocryolls, Haplaquolls, Cryaquolls, Cryaquepts, Haplaquepts, Haplaquents, Cryaquents	Sitka spruce, western hemlock, western red cedar, shorepine wetland plants.	Douglas-fir/western hemlock/Sitka spruce forests, wetlands. Dairy farms, urban/rural residential developments, recreation, pastureland.
1b. Coastal Uplands	Coastal headlands and upland terraces with moderate to high gradient, steep ocean streams.	Quaternary glacial drift and marine sediments.	Inceptisols (Haplohumbrepts, Dystrochrepts, Andic Dystrochrepts), Andisols (Vitrandepts, Fulvudands, Melanudands)	Udic, Cryic, Aquic, Xeric, Mesic, Frigid, Cryic, Typic, Humic, Fluvaquentic, Haplocryolls, Haplaquolls, Cryaquolls, Cryaquepts, Haplaquepts, Haplaquents, Cryaquents	Sitka spruce, western hemlock, western red cedar.	Douglas-fir/western hemlock/Sitka spruce/ western red cedar forests. Forestry, rural residential development, recreation.
1c. Low Olympics	Low mountains with U-shaped valleys and high gradient streams. Higher snow water processes.	Lower Tertiary sandstone and siltstone.	Andisols (Vitrandepts)	Udic, Cryic, Aquic, Xeric, Mesic, Frigid, Cryic, Typic, Humic, Fluvaquentic, Haplocryolls, Haplaquolls, Cryaquolls, Cryaquepts, Haplaquepts, Haplaquents, Cryaquents	Western hemlock, western red cedar, noble fir, Douglas-fir, red alder, Sitka spruce.	Douglas-fir/western hemlock/red alder/bigleaf maple forests. Forestry, recreation, some rural residential development.
1d. Volcanics	Steeply sloping mountainsides. High gradient, cascading streams and rivers mixed and have wide riparian flow.	Tertiary basalts, lavas, pillow lavas, tuffaceous basalt, breccia, porphyritic basalt, basaltic andesite/volcanic/hydrothermally altered/intrusive rocks. Minor alluvial/glacial deposits.	Andisols (Vitrandepts), Haplumbrepts, Dystrochrepts, Fulvudands, Melanudands	Udic, Cryic, Aquic, Xeric, Mesic, Frigid, Cryic, Typic, Humic, Fluvaquentic, Haplocryolls, Haplaquolls, Cryaquolls, Cryaquepts, Haplaquepts, Haplaquents, Cryaquents	Western hemlock, western red cedar, Douglas-fir.	Douglas-fir/western hemlock/silver fir/Pacific silver fir/mountain hemlock/noble fir/subalpine parkland/alpine meadows. Forestry, recreation, rural residential development.
1e. Outwash	Undulating terraces and plateaus. Medium gradient, streams and rivers occur and have more moisture flow than elsewhere in Ecoregion 1.	Pleistocene glacial outwash deposits.	Andisols (Fulvudands)	Udic, Cryic, Aquic, Xeric, Mesic, Frigid, Cryic, Typic, Humic, Fluvaquentic, Haplocryolls, Haplaquolls, Cryaquolls, Cryaquepts, Haplaquepts, Haplaquents, Cryaquents	Western hemlock, western red cedar, Douglas-fir.	Douglas-fir/western hemlock/red alder/bigleaf maple/western red cedar forests. Forestry, rural residential development.
1f. Willapa Hills	Low, rolling hills and mountains with medium gradient, narrow streams and rivers. Low drainage density.	Miocene sandstone, siltstone, shale.	Andisols (Fulvudands, Hapludands), Alfisols (Haplohumults), Inceptisols (Dystrochrepts, Humic Dystrochrepts, Fluvaquentic Dystrochrepts, Fluvaquentic Haplocryepts)	Udic, Cryic, Aquic, Xeric, Mesic, Frigid, Cryic, Typic, Humic, Fluvaquentic, Haplocryolls, Haplaquolls, Cryaquolls, Cryaquepts, Haplaquepts, Haplaquents, Cryaquents	Western hemlock, western red cedar, Douglas-fir.	Douglas-fir/western hemlock/red alder/western red cedar forests. Forestry, some rural residential development, pastureland.
1g. Mid-Coastal Sedimentary	Hydrometry sloping, dissected mountainous with moderate to high gradient, narrow streams.	Eocene marine sandstone, siltstone, mudstone, conglomerate.	Inceptisols (Dystrochrepts, Haplocryepts, Haplaquepts), Alfisols (Fulvudands, Haplohumults)	Udic, Cryic, Aquic, Xeric, Mesic, Frigid, Cryic, Typic, Humic, Fluvaquentic, Haplocryolls, Haplaquolls, Cryaquolls, Cryaquepts, Haplaquepts, Haplaquents, Cryaquents	Western hemlock, western red cedar, Douglas-fir.	Douglas-fir/western hemlock/red alder/western red cedar forests. Forestry, some rural residential development.
1h. Southern Oregon Coastal Mountains	Dissected mountains with high gradient, narrow streams and rivers. This ecoregion is part of the Siskiyou Mountains.	Cretaceous and Jurassic volcanic, shale, sandstone, conglomerate, graywacke; granitic rhyolite, serpentine.	Inceptisols (Dystrochrepts, Haplocryepts, Haplaquepts), Alfisols (Fulvudands, Haplohumults)	Udic, Cryic, Aquic, Xeric, Mesic, Frigid, Cryic, Typic, Humic, Fluvaquentic, Haplocryolls, Haplaquolls, Cryaquolls, Cryaquepts, Haplaquepts, Haplaquents, Cryaquents	Tanoak, Douglas-fir, western hemlock, true fir, Port Orford cedar, Jeffrey pine, Shasta red fir.	Douglas-fir/tan oak/Shasta red fir/Port Orford cedar forests. Forestry, recreation, some rural residential development.
1i. Redwood Zone	Dissected coastal mountains and foothills with medium gradient, streams abound.	Jurassic greywacke.	Inceptisols (Haplumbrepts, Ochrepts (Haplohumults))	Udic, Cryic, Aquic, Xeric, Mesic, Frigid, Cryic, Typic, Humic, Fluvaquentic, Haplocryolls, Haplaquolls, Cryaquolls, Cryaquepts, Haplaquepts, Haplaquents, Cryaquents	Redwood, Douglas-fir, western hemlock, tanoak, Sitka spruce.	Redwood/Douglas-fir/western hemlock/tanoak/Sitka spruce forests. Forestry, recreation, rural residential development.

2. PUGET LOWLAND

Level IV Ecoregion	Physiography	Geology	Soil	Climate	Potential Natural Vegetation	Land Use and Land Cover
2a. Puget–Lowland	Undulating glacial drift plains, terraces, and floodplains with low gradient, meandering streams and rivers.	Holocene alluvium, Pleistocene glacial drift.	Spodosols (Haplorthods), Alfisols (Umbraquults)	Udic, Cryic, Aquic, Xeric, Mesic, Frigid, Cryic, Typic, Humic, Fluvaquentic, Haplocryolls, Haplaquolls, Cryaquolls, Cryaquepts, Haplaquepts, Haplaquents, Cryaquents	Western hemlock, western red cedar, noble fir, Douglas-fir, red alder, bigleaf maple.	Douglas-fir/western hemlock/red alder/bigleaf maple forests. Forestry, urban/residential development.
2b. Eastern Puget Riverine Lowlands	Floodplains and terraces with meandering, slow, mature lakes, and meander scars. Floodwater and estuarine wetlands occur but were more extensive in the past.	Tertiary sedimentary rock.	Spodosols (Haplorthods), Inceptisols (Xerochrepts)	Udic, Cryic, Aquic, Xeric, Mesic, Frigid, Cryic, Typic, Humic, Fluvaquentic, Haplocryolls, Haplaquolls, Cryaquolls, Cryaquepts, Haplaquepts, Haplaquents, Cryaquents	Western hemlock, western red cedar, Douglas-fir.	Douglas-fir/western hemlock/red alder/bigleaf maple forests. Forestry, urban/residential development, recreation.
2c. San Juan Islands	Glacial scoured islands with small mountainous streams and limited surface water.	Miocene and Paleocene sedimentary rock.	Spodosols (Haplorthods), Alfisols (Argixerolls), Inceptisols (Xerochrepts), Aquolls (Melanoxeralfs, Vitrandepts)	Udic, San Juan, Pitkin, Rio, Crowland. Very gravelly are water or gravelly loam.	Douglas-fir, grand fir, western red cedar/bigleaf maple forests.	Douglas-fir/western hemlock/red alder/bigleaf maple forests. Forestry, urban/residential development, recreation.
2d. Olympic Rainshadow	Rolling glacial till plains with small, low to medium gradient streams. Drainage patterns are often divergent or internal. Fresh water supplies are limited in the east.	Pleistocene Vashon glacial ground moraine deposits.	Inceptisols (Dystrochrepts, Xerochrepts, Haplocryepts (Argixerolls)), Alfisols (Argixerolls, Haplohumults)	Udic, Cryic, Aquic, Xeric, Mesic, Frigid, Cryic, Typic, Humic, Fluvaquentic, Haplocryolls, Haplaquolls, Cryaquolls, Cryaquepts, Haplaquepts, Haplaquents, Cryaquents	Western hemlock, western red cedar, Douglas-fir, some grandfir, grand fir.	Douglas-fir/western hemlock/red alder/bigleaf maple forests. Forestry, urban/residential development.
2e. Eastern Puget Uplands	Rolling moraines and foothills with lakes and streams moderate and rivers.	Pleistocene Vashon glacial moraine deposits. Tertiary sedimentary rock.	Inceptisols (Dystrochrepts, Xerochrepts), Andisols (Vitrandepts)	Udic, Cryic, Aquic, Xeric, Mesic, Frigid, Cryic, Typic, Humic, Fluvaquentic, Haplocryolls, Haplaquolls, Cryaquolls, Cryaquepts, Haplaquepts, Haplaquents, Cryaquents	Western hemlock, western red cedar, Douglas-fir, some Oregon fir.	Douglas-fir and western hemlock forests. Forestry, urban/residential development, recreation.
2f. Central Puget Lowland	Undulating glacial drift plains with lakes and small, elevated streams. Coastline is irregularly shaped. It is characterized by many bays and some cliffs.	Pleistocene drift. Vashon glacial till.	Inceptisols (Dystrochrepts, Xerochrepts)	Udic, Cryic, Aquic, Xeric, Mesic, Frigid, Cryic, Typic, Humic, Fluvaquentic, Haplocryolls, Haplaquolls, Cryaquolls, Cryaquepts, Haplaquepts, Haplaquents, Cryaquents	Western hemlock, western red cedar, Douglas-fir, some red alder, bigleaf maple.	Douglas-fir/western hemlock/red alder/bigleaf maple forests. Forestry, urban/residential development.
2g. Southern Puget Prairies	Nearly level or rolling glacial outwash and till plains with low gradient streams and lakes.	Pleistocene Vashon glacial outwash and till deposits.	Inceptisols (Dystrochrepts, Xerochrepts), Andisols (Melanoxeralfs)	Udic, Cryic, Aquic, Xeric, Mesic, Frigid, Cryic, Typic, Humic, Fluvaquentic, Haplocryolls, Haplaquolls, Cryaquolls, Cryaquepts, Haplaquepts, Haplaquents, Cryaquents	Douglas-fir, prairie forb and grass/bigleaf maple forests.	Douglas-fir/western hemlock/bigleaf maple forests. Forestry, urban/residential development.
2h. Cowlitz/Chehalis Foothills	Low, rolling to steeply sloping hills with moderate to high gradient streams. Unaffected by commercial Vashon glaciation.	Pleistocene alpine glacial deposits, Tertiary sandstone and siltstone, Eocene andesite.	Alfisols (Fulvudands), Andisols (Dystrochrepts)	Udic, Cryic, Aquic, Xeric, Mesic, Frigid, Cryic, Typic, Humic, Fluvaquentic, Haplocryolls, Haplaquolls, Cryaquolls, Cryaquepts, Haplaquepts, Haplaquents, Cryaquents	Douglas-fir, western hemlock, western red cedar, bigleaf maple.	Douglas-fir/western hemlock/bigleaf maple forests. Forestry, urban/residential development.
2i. Cowlitz/Newaukum Prairie Floodplains	Rolling terraces and floodplains with meandering streams and willow lakes. Unaffected by commercial Vashon glaciation.	Holocene alluvial deposits. Pleistocene alpine glacial outwash material.	Alfisols (Fulvudands), Andisols (Dystrochrepts, Fulvudands), Mollisols (Argiaquolls)	Udic, Cryic, Aquic, Xeric, Mesic, Frigid, Cryic, Typic, Humic, Fluvaquentic, Haplocryolls, Haplaquolls, Cryaquolls, Cryaquepts, Haplaquepts, Haplaquents, Cryaquents	Douglas-fir, western hemlock, western red cedar, bigleaf maple, oak woodlands, prairie.	Douglas-fir/western hemlock/bigleaf maple forests. Forestry, urban/residential development, recreation.

3. WILLAMETTE VALLEY

Level IV Ecoregion	Physiography	Geology	Soil	Climate	Potential Natural Vegetation	Land Use and Land Cover
3a. Portland/ Vancouver Basin	Undulating terraces and floodplains with low gradient, meandering streams. Numerous wetlands, oxbow lakes and ponds.	Pleistocene unconsolidated and semi-consolidated glacial/fluvial deposits on a fault block basin.	Mollisols (Argiaquolls, Argixerolls, Endoaquolls, Inceptisols (Xerarents, Fluvaquentic, Haplocryepts, Haplustepts)	Udic, Xeric, Aquic, Mesic, Frigid, Cryic, Typic, Humic, Fluvaquentic, Haplocryolls, Haplaquolls, Cryaquolls, Cryaquepts, Haplaquepts, Haplaquents, Cryaquents	Prairie (maintained by Native American burning), Oregon white oak, Douglas-fir, Oregon ash, mixed woodland and conifer.	Urban/suburban/rural residential/industrial activity, pastureland, nursery crops.
3b. Willamette River and Tributaries Valley Floor	Floodplains with low gradient, narrow, meandering rivers and associated willow/cottonwood wetlands.	Holocene and Pleistocene fluvial sediments.	Mollisols (Argiaquolls, Endoaquolls, Haplustolls), Inceptisols (Endoaquepts)	Udic, Xeric, Aquic, Mesic, Frigid, Cryic, Typic, Humic, Fluvaquentic, Haplocryolls, Haplaquolls, Cryaquolls, Cryaquepts, Haplaquepts, Haplaquents, Cryaquents	Cottonwood, willow, Oregon ash, Douglas-fir, bigleaf maple, Oregon white oak, prairie forb and grass.	Urban/suburban/rural residential/industrial activity, pastureland, nursery crops, recreation.
3c. Willamette Valley Foothills	Undulating to rolling hills and mountains with moderate gradient, streams and rivers. Drainage is irregular; there is a low drainage density.	Miocene and Pliocene basalt, andesite, tuff, breccia, lahar, and basaltic andesite flows. Minor alluvial/glacial deposits on a terrace.	Alfisols (Haplohumults, Argixerolls, Fulvudands), Andisols (Vitrandepts), Mollisols (Haplohumults, Argixerolls, Haplustolls), Inceptisols (Dystrochrepts, Haplocryepts)	Udic, Xeric, Aquic, Mesic, Frigid, Cryic, Typic, Humic, Fluvaquentic, Haplocryolls, Haplaquolls, Cryaquolls, Cryaquepts, Haplaquepts, Haplaquents, Cryaquents	Douglas-fir, western hemlock, Oregon white oak, bigleaf maple, Pacific madrone, prairie forb and grass.	Douglas-fir/western hemlock/Oregon white oak/bigleaf maple forests. Forestry, urban/residential development, recreation.
3d. Valley Foothills	Rolling foothills with moderate gradient, streams abound.	Tertiary basalt and basaltic andesite.	Alfisols (Haplohumults), Andisols (Dystrochrepts, Fulvudands), Mollisols (Haplohumults), Inceptisols (Haplumbrepts)	Udic, Xeric, Aquic, Mesic, Frigid, Cryic, Typic, Humic, Fluvaquentic, Haplocryolls, Haplaquolls, Cryaquolls, Cryaquepts, Haplaquepts, Haplaquents, Cryaquents	Douglas-fir, western hemlock, Oregon white oak, bigleaf maple, Pacific madrone, prairie forb and grass.	Douglas-fir/western hemlock/Oregon white oak/bigleaf maple forests. Forestry, urban/residential development, recreation.

4. CASCADES

Level IV Ecoregion	Physiography	Geology	Soil	Climate	Potential Natural Vegetation	Land Use and Land Cover
4a. Western Cascades Lowlands and Valleys	Primarily mountainous ranges and valleys with moderate and medium gradient rivers and streams. U-shaped, glaciated valleys in the east.	Oligocene–Miocene andesitic and basaltic lava flows and breccia.	Inceptisols (Haplumbrepts, Ochrepts (Haplohumults, Fulvudands, Palehumults), Andisols (Vitrandepts)	Udic, Xeric, Aquic, Mesic, Frigid, Cryic, Typic, Humic, Fluvaquentic, Haplocryolls, Haplaquolls, Cryaquolls, Cryaquepts, Haplaquepts, Haplaquents, Cryaquents	Western hemlock, western red cedar, Douglas-fir.	Douglas-fir/western hemlock/western red cedar/true fir/grand fir/noble fir forests and clearcuts. Forestry, rural residential development, pastureland.
4b. Western Cascades Montane Highlands	Steep, glaciated, dissected mountains and ridges with high to moderate gradient streams and glacial rock basin lakes.	Oligocene–Miocene andesitic and basaltic lava flows and breccia.	Inceptisols (Haplumbrepts, Andisols (Vitrandepts, Fulvudands), Spodosols (Haplorthods)	Udic, Xeric, Aquic, Mesic, Frigid, Cryic, Typic, Humic, Fluvaquentic, Haplocryolls, Haplaquolls, Cryaquolls, Cryaquepts, Haplaquepts, Haplaquents, Cryaquents	Mountain hemlock, Pacific silver fir, true grand fir, noble fir.	Pacific silver fir/western hemlock/ Douglas-fir/mountain hemlock/noble fir/subalpine parkland/alpine meadows. Forestry, recreation, rural residential development.
4c. Cascade Crest Montane Forest	High, undulating, volcanic plateau punctuated by basin and range, fault-block mountains. Numerous glacial rock basin lakes. Broad valleys are collapsed lava flows. Watershed zone are found in southwestern Washington Cascades.	Pleistocene Pliocene basalts and andesitic lava flows, breccia, pyroclastics; some Pleistocene alpine glacial deposits.	Spodosols (Haplocryods, Haplorthods), Andisols (Vitrandepts, Fulvudands), Inceptisols (Cryochrepts, Cryumbrepts)	Udic, Xeric, Aquic, Mesic, Frigid, Cryic, Typic, Humic, Fluvaquentic, Haplocryolls, Haplaquolls, Cryaquolls, Cryaquepts, Haplaquepts, Haplaquents, Cryaquents	Lodgepole, Pumice, Pacific silver fir, mountain hemlock, subalpine fir, noble fir, Douglas-fir.	Forests composed of mountain hemlock, Pacific silver fir, Engelmann spruce, and subalpine fir/ grand fir, Douglas-fir, western hemlock, western red cedar forests. Forestry, recreation, some rural residential development.
4d. Cascades Subalpine/Alpine	High, glaciated, volcanic peaks with cascading streams, glacial steppes, and cirques. Active mountainside and glacially scoured terrain is the result of recent volcanic and glacial activity.	Pleistocene basalt and andesitic lavas; some alpine glacial deposits.	Entisols (Cryorthents)	Udic, Xeric, Aquic, Mesic, Frigid, Cryic, Typic, Humic, Fluvaquentic, Haplocryolls, Haplaquolls, Cryaquolls, Cryaquepts, Haplaquepts, Haplaquents, Cryaquents	Bare rock, alpine.	Bare rock, glaciers, subalpine meadows, and forests. Limited use include backcountry recreation. Ecoregion 4d is an important regional water source.
4e. High Southern Cascades/Western Forest	High, undulating, dormant pumiceous/lithic volcanic mesic and affected by alpine glaciation. Many glacier-fed basin lakes occur. Site preparation and permanent erosion have medium to high gradients.	Pleistocene alpine glacial deposits. Pliocene and Miocene andesite and olivine basalt.	Andisols (Vitrandepts), Mollisols (Cryohumults), Inceptisols (Cryochrepts), Spodosols (Haplocryods)	Udic, Xeric, Aquic, Mesic, Frigid, Cryic, Typic, Humic, Fluvaquentic, Haplocryolls, Haplaquolls, Cryaquolls, Cryaquepts, Haplaquepts, Haplaquents, Cryaquents	Mountain hemlock, Pacific silver fir, noble fir, grand fir, white fir.	Douglas-fir/western hemlock/Pacific silver fir/mountain hemlock/noble fir/subalpine parkland/alpine meadows. Forestry, recreation, some rural residential development.
4f. Umpqua Cascades	Highly dissected mountains with a few small lakes and high to medium gradient streams and rivers.	Tertiary pyroclastic rocks, basalt and basaltic andesite lava flows, breccia, tuff, sandstone, siltstone.	Andisols (Vitrandepts), Inceptisols (Dystrochrepts)	Udic, Xeric, Aquic, Mesic, Frigid, Cryic, Typic, Humic, Fluvaquentic, Haplocryolls, Haplaquolls, Cryaquolls, Cryaquepts, Haplaquepts, Haplaquents, Cryaquents	Douglas-fir, western hemlock, western red cedar, noble fir, Pacific silver fir, mountain hemlock, bigleaf maple.	Douglas-fir/western hemlock/Pacific silver fir/mountain hemlock/noble fir/subalpine parkland/alpine meadows. Forestry, recreation, some rural residential development.
4g. Southern Cascades	Mountains with moderate slopes, broad valleys, and medium to high gradient streams and rivers. Mountains, a few large mountain streams, mixed glacier steeps, and straight number of intermittent streams.	Pliocene basalt and basaltic andesite.	Alfisols (Fulvudands), Inceptisols (Dystrochrepts, Fulvudands), Andisols (Vitrandepts), Mollisols (Argixerolls)	Udic, Xeric, Aquic, Mesic, Frigid, Cryic, Typic, Humic, Fluvaquentic, Haplocryolls, Haplaquolls, Cryaquolls, Cryaquepts, Haplaquepts, Haplaquents, Cryaquents	White fir, Douglas-fir, ponderosa pine, noble fir, grand fir, incense-cedar, hemlock.	Extensive alpine open conifer forests with white fir, other extensive Douglas-fir and ponderosa pine and prevalent of low elevations and Shasta red fir, pockets at high elevations. Land use include forestry, recreation, and some grazing. Ecoregion 4g is an important regional water source.

9. EASTERN CASCADES SLOPES AND FOOTHILLS

Level IV Ecoregion	Physiography	Geology	Soil	Climate	Potential Natural Vegetation	Land Use and Land Cover
9a. Yakima Plateau and Slopes	High, dissected plateaus, basin, and canyons with moderate to high gradient, mountainous streams and rivers. Irrigation common especially in the south.	Pleistocene and Miocene basalt flows.	Alfisols (Haplocryalfs), Inceptisols (Haplocryepts), Mollisols (Haplocryolls), Aridisols (Argicryolls, Haplocryolls)	Aridic, Xeric, Udic, Aquic, Mesic, Frigid, Cryic, Typic, Humic, Fluvaquentic, Haplocryolls, Haplaquolls, Cryaquolls, Cryaquepts, Haplaquepts, Haplaquents, Cryaquents	Lodgepole, Douglas-fir, Ponderosa pine, bitterbrush, Oregon white oak, bluebunch wheatgrass, Idaho fescue, Sandberg bluegrass, needle-and-thread grass.	Douglas-fir/lodgepole/bitterbrush/bluebunch wheatgrass/Idaho fescue/Sandberg bluegrass/needle-and-thread grass forests. Forestry, recreation, rural residential development.
9b. Grand Fir Mixed Forest	High, glaciated plateaus and mountains with high gradient, dissected streams and rivers. Evaporation and snow accumulation are main factors.	Pleistocene and Miocene andesitic and basalt flows.	Alfisols (Vitrixerands, Haplocryalfs), Inceptisols (Xeropsamments, Haplocryepts), Andisols (Haplocryands, Fulvicryands), Spodosols (Cryumbrepts)	Aridic, Xeric, Udic, Aquic, Mesic, Frigid, Cryic, Typic, Humic, Fluvaquentic, Haplocryolls, Haplaquolls, Cryaquolls, Cryaquepts, Haplaquepts, Haplaquents, Cryaquents	Ponderosa pine, Douglas-fir, noble fir, western hemlock, western red cedar, grand fir, Shasta red fir, Engelmann spruce, subalpine fir.	Douglas-fir/lodgepole/bitterbrush/bluebunch wheatgrass/Idaho fescue/Sandberg bluegrass/needle-and-thread grass forests. Forestry, recreation, rural residential development.
9c. Cle Elum/Cowiche Eastern Cascades Columbia Foothills	Undulating, low mountains, plateaus, and valleys; not permanent any snowmelt, mostly medium gradient, streams and rivers.	Miocene–Pliocene basalt. Miocene-Columbia River basalt.	Alfisols (Haplocryalfs), Mollisols (Haplocryolls), Inceptisols (Vitrandepts)	Aridic, Xeric, Udic, Aquic, Mesic, Frigid, Cryic, Typic, Humic, Fluvaquentic, Haplocryolls, Haplaquolls, Cryaquolls, Cryaquepts, Haplaquepts, Haplaquents, Cryaquents	Ponderosa pine, bitterbrush, Douglas-fir, Oregon white oak, grasslands.	Douglas-fir, ponderosa pine, Oregon white oak, grasslands. In the east, oak woodland and ponderosa pine/ Douglas-fir and western hemlock forests dominate, grazing land use include forestry, recreation, grazing land, and cropland. Most of the land is privately owned and is cropland/ water source.
9d. Ponderosa Pine/Bitterbrush Woodland	High, undulating plateaus and canyons with low mountains, moderate gradient streams. Stream flow controlled by soil moisture due to volcanic-influenced hydrogeology.	Mt. Mazama ash, Pleistocene and Pliocene olivine basalt, olivine basaltic andesite.	Andisols (Vitrixerands)	Aridic, Xeric, Udic, Aquic, Mesic, Frigid, Cryic, Typic, Humic, Fluvaquentic, Haplocryolls, Haplaquolls, Cryaquolls, Cryaquepts, Haplaquepts, Haplaquents, Cryaquents	Ponderosa pine, bitterbrush.	Ponderosa pine, bitterbrush. Forestry, some rural residential development, recreation. Most of the land is privately owned and is cropland/ water source.
9e. Pumice Plateau Forest	High, undulating volcanic plateau with terraced basins and mountainous and dissected streams and rivers. Snowmelt is the main source of water. Some lakes occur.	Mt. Mazama ash and pumice. Pleistocene basalt and andesite. Miocene olivine basalt.	Andisols (Vitrixerands)	Aridic, Xeric, Udic, Aquic, Mesic, Frigid, Cryic, Typic, Humic, Fluvaquentic, Haplocryolls, Haplaquolls, Cryaquolls, Cryaquepts, Haplaquepts, Haplaquents, Cryaquents	Shoreline, Lodgepole, Douglas, Jeffrey, Ponderosa pine, Douglas-fir, western hemlock, western red cedar, bitterbrush, Idaho fescue, bluebunch wheatgrass.	Lodgepole pine and ponderosa pine forests. Forestry and grazing. Most of the land is owned by the public.
9f. Lost river Pumice Plateau Basins	High elevation basins with internal drainage, marshes, lakes, and rivers. Medium to low gradient rivers are sequestered below the escarpment and have a wide riparian flow. Snowmelt is the main source of water. High ground water table to be at Pine Basin.	Mt. Mazama ash deposits, mass-consolidated tuffaceous and fluvial sediments of Pleistocene age.	Andisols (Vitrixerands), Vitrixerands, Cryandepts, Haplocryolls, Cryepts)	Aridic, Xeric, Udic, Aquic, Mesic, Frigid, Cryic, Typic, Humic, Fluvaquentic, Haplocryolls, Haplaquolls, Cryaquolls, Cryaquepts, Haplaquepts, Haplaquents, Cryaquents	Pumice, lodgepole, Ponderosa, Douglas-fir, western hemlock, western red cedar, bitterbrush, Idaho fescue, bluebunch wheatgrass.	Forests composed of mountain hemlock, Pacific silver fir, Engelmann spruce, and subalpine fir/ grand fir, Douglas-fir, western hemlock, western red cedar forests. Forestry, recreation, some rural residential development.
9g. Klamath/Lower Lake Warm Wet Basins	High elevation basins with internal drainage, marshes, shallow mollisols. Water loss from natural by evaporation.	Mt. Mazama ash deposits. Pleistocene basalt and andesite. Miocene olivine basalt.	Andisols (Vitrixerands), Inceptisols (Haplocryepts), Mollisols (Argicryolls, Haplocryolls), Aridisols (Argicryolls, Haplocryolls), Entisols (Cryopsamments)	Aridic, Xeric, Udic, Aquic, Mesic, Frigid, Cryic, Typic, Humic, Fluvaquentic, Haplocryolls, Haplaquolls, Cryaquolls, Cryaquepts, Haplaquepts, Haplaquents, Cryaquents	Lodgepole, Douglas-fir, western hemlock, western red cedar, bitterbrush, Idaho fescue, bluebunch wheatgrass.	Forests composed of mountain hemlock, Pacific silver fir, Engelmann spruce, and subalpine fir/ grand fir, Douglas-fir, western hemlock, western red cedar forests. Forestry, recreation, some rural residential development.
9h. Fremont Juniper/ Ponderosa Pine Woodland	High, undulating lake, basins, and escarpments with mountainous and permanents. Aridisols (Argicryolls, Haplocryolls, Haplocryepts) and Inceptisols (Haplocryepts) are the most common.	Mt. Mazama ash deposits. Pleistocene basalt and andesite. Miocene olivine basalt. Pliocene olivine basalt, andesite, andesitic.	Aridisols (Argicryolls, Haplocryolls), Inceptisols (Haplocryepts), Mollisols (Argicryolls, Haplocryolls), Entisols (Cryopsamments)	Aridic, Xeric, Udic, Aquic, Mesic, Frigid, Cryic, Typic, Humic, Fluvaquentic, Haplocryolls, Haplaquolls, Cryaquolls, Cryaquepts, Haplaquepts, Haplaquents, Cryaquents	Western juniper, bitterbrush, Idaho fescue, Sandberg bluegrass, needle-and-thread grass, Ponderosa pine, Douglas-fir, western hemlock, western red cedar.	Western juniper, bitterbrush, Idaho fescue, Sandberg bluegrass, needle-and-thread grass forests. Forestry, recreation, some rural residential development.

77. NORTH CASCADES

Level IV Ecoregion	Physiography	Geology	Soil	Climate	Potential Natural Vegetation	Land Use and Land Cover
77a. North Cascades Lowland Forests	Low mountainous and broad glaciated valleys with moderate, moderate gradient, glacial-fed rivers and streams. Snowmelt and glacial silver.	Miocene and Paleocene conglomerates, mica, greywacke.	Andisols (Haplocryands), Spodosols (Haplocryods, Humicryods), Inceptisols (Haplocryepts, Humicryepts)	Cryic, Udic, Aquic, Xeric, Mesic, Frigid, Cryic, Typic, Humic, Fluvaquentic, Haplocryolls, Haplaquolls, Cryaquolls, Cryaquepts, Haplaquepts, Haplaquents, Cryaquents	Western hemlock, western red cedar, Douglas-fir.	Western hemlock, western red cedar, Douglas-fir.
77b. North Cascades Highland Forests	High, glaciated ridges, with permanent, cascading glacial streams and glacial rock basin lakes. Some rock and outcroppings.	Miocene andesitic and basalt flows.	Spodosols (Cryorthods, Haplocryods, Humicryods), Andisols (Cryandepts, Haplocryands, Fulvicryands), Inceptisols (Haplocryepts, Humicryepts)	Cryic, Udic, Aquic, Xeric, Mesic, Frigid, Cryic, Typic, Humic, Fluvaquentic, Haplocryolls, Haplaquolls, Cryaquolls, Cryaquepts, Haplaquepts, Haplaquents, Cryaquents	Mountain hemlock, Pacific silver fir, subalpine fir, noble fir, Douglas-fir, western hemlock.	Mountain hemlock/Pacific silver fir/subalpine fir/noble fir/Douglas-fir/western hemlock forests. Forestry, recreation, rural residential development.
77c. North Cascades Subalpine/ Alpine	High mountain areas with bare rock, glaciers, cirques. Permanent high glaciers and snowfields. Many glacial rock basin lakes.	Miocene andesitic and basalt flows. Pleistocene basalt and andesite.	Andisols (Haplocryands), Spodosols (Haplocryods, Humicryods), Inceptisols (Haplocryepts, Humicryepts)	Cryic, Udic, Aquic, Xeric, Mesic, Frigid, Cryic, Typic, Humic, Fluvaquentic, Haplocryolls, Haplaquolls, Cryaquolls, Cryaquepts, Haplaquepts, Haplaquents, Cryaquents	Mountain hemlock, Pacific silver fir, subalpine fir, noble fir, Douglas-fir, western hemlock.	Mountain hemlock/Pacific silver fir/subalpine fir/noble fir/Douglas-fir/western hemlock forests. Forestry, recreation, rural residential development.
77d. Pumice Scablands	Broad, glaciated mountains with cirques, alpine glaciers covered with thick ash. Many glacial rock basin lakes and streams.	Pleistocene basalt and andesitic lavas, breccia, pyroclastics; some Pleistocene alpine glacial deposits.	Andisols (Cryandepts), Spodosols (Haplocryods, Humicryods), Inceptisols (Haplocryepts, Humicryepts)	Cryic, Udic, Aquic, Xeric, Mesic, Frigid, Cryic, Typic, Humic, Fluvaquentic, Haplocryolls, Haplaquolls, Cryaquolls, Cryaquepts, Haplaquepts, Haplaquents, Cryaquents	Mountain hemlock, Pacific silver fir, subalpine fir, noble fir, Douglas-fir, western hemlock.	Mountain hemlock/Pacific silver fir/subalpine fir/noble fir/Douglas-fir/western hemlock forests. Forestry, recreation, rural residential development.
77e. Okanogan Pacific Rim	Rounded mountains, ridges, and U-shaped valleys with medium to high gradient, permanent and intermittent streams and rivers. Snowmelt and glacial silver.	Miocene marine sandstone, shale, granitic rocks, pre-Cretaceous gneiss and schist.	Inceptisols (Humicryepts), Alfisols (Haplocryalfs), Spodosols (Cryohumods)	Cryic, Udic, Aquic, Xeric, Mesic, Frigid, Cryic, Typic, Humic, Fluvaquentic, Haplocryolls, Haplaquolls, Cryaquolls, Cryaquepts, Haplaquepts, Haplaquents, Cryaquents	Douglas-fir, western hemlock, western red cedar, noble fir, Pacific silver fir, mountain hemlock, bigleaf maple.	Douglas-fir/western hemlock/western red cedar/noble fir/Pacific silver fir/mountain hemlock/bigleaf maple forests. Forestry, recreation, rural residential development.
77f. Chelan Ophiolite Hills	High mountains with U-shaped valleys; with a rolling drainage pattern. The mountainside and intermittent streams have steep gradients and high sediment loads. Glacial basin often contain lakes and were formed by alpine glaciation. Much of the continental glacial ice.	Miocene marine sandstone, shale, granitic rocks, pre-Cretaceous gneiss and schist.	Inceptisols (Humicryepts), Alfisols (Haplocryalfs), Spodosols (Cryohumods)	Cryic, Udic, Aquic, Xeric, Mesic, Frigid, Cryic, Typic, Humic, Fluvaquentic, Haplocryolls, Haplaquolls, Cryaquolls, Cryaquepts, Haplaquepts, Haplaquents, Cryaquents	Douglas-fir, western hemlock, western red cedar, noble fir, Pacific silver fir, mountain hemlock, bigleaf maple.	Douglas-fir/western hemlock/western red cedar/noble fir/Pacific silver fir/mountain hemlock/bigleaf maple forests. Forestry, recreation, rural residential development.
77g. Pasayten/ Ashnola Highlands	High, glaciated mountainous with cirques, alpine glaciers covered with thick ash. Snowmelt and glacial silver. Many glacial rock basin lakes and streams.	Miocene marine sandstone, shale, granitic rocks, pre-Cretaceous gneiss and schist.	Inceptisols (Humicryepts), Alfisols (Haplocryalfs), Spodosols (Cryohumods)	Cryic, Udic, Aquic, Xeric, Mesic, Frigid, Cryic, Typic, Humic, Fluvaquentic, Haplocryolls, Haplaquolls, Cryaquolls, Cryaquepts, Haplaquepts, Haplaquents, Cryaquents	Douglas-fir, western hemlock, western red cedar, noble fir, Pacific silver fir, mountain hemlock, bigleaf maple.	Douglas-fir/western hemlock/western red cedar/noble fir/Pacific silver fir/mountain hemlock/bigleaf maple forests. Forestry, recreation, rural residential development.
77h. Okanogan Pacific Hills	Rounded mountains, ridges, and U-sha