

METADATA AND ECOREGIONAL DESCRIPTIONS

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Spatial_Reference_Information:

Horizontal_Coordinate_System_Definition:

Planar:

Map_Projection:

Map_Projection_Name: Lambert Conformal Conic

Datum: nad 83

Spheroid: grs 1980

Units: 3.28084

First Standard_Parallel: 43 00 00

Second Standard_Parallel: 45 30 00

Longitude_of_Central_Meridian: -120 30 00

Latitude_of_Projection_Origin: 41 45 00

False_Easting: 400000

False_Northing: 0.00000

Level III and IV Ecoregion Descriptions for Oregon Draft 8, 11/29/00 – DO NOT DISTRIBUTE

by Sandra A. Bryce and Alan J. Woods

The following ecoregion descriptions are derived from:

Bryce, Sandra A., Thor D. Thorson, Jimmy Kagan, Alan J. Woods, Chad McGrath, James M. Omernik, David E. Pater, and Jeffrey A. Comstock. In preparation. Ecoregions of Oregon intended for publication by the US Department of the Interior - Geological Survey

Clarke, Sharon E., and Sandra A. Bryce, eds., 1997, Hierarchical subdivisions of the Columbia Plateau and Blue Mountains Ecoregions, Oregon and Washington. Portland: U.S. Department of Agriculture-Forest Service General Technical Report PNW-GTR-395, 114 p.

Pater, David E., Sandra A. Bryce, Thor D. Thorson, Jimmy Kagan, Chris Chappell, James M. Omernik, Sandra H. Azevedo, and Alan J. Woods. 1998. Ecoregions of Western Washington and Oregon (2 sided color poster with map, descriptive text, summary tables, and photographs): Reston, Virginia, US Department of the Interior - Geological Survey (map scale: 1:1,350,000)*. ISBN 0-607-89571-3

1. COAST RANGE

The low mountains of Ecoregion 1 are covered by highly productive, rain-drenched coniferous forests. Sitka spruce forests originally dominated the fog-shrouded coast, while a mosaic of western red cedar, western hemlock, and seral Douglas-fir blanketed inland areas. Today Douglas-fir plantations are prevalent on the intensively logged and managed landscape.

1a. Coastal Lowlands

The Coastal Lowlands ecoregion encompasses estuarine marshes, freshwater lakes, black-water streams, marine terraces, and sand dune areas. Elevations range from sea level to 300 feet. Channelization and diking have converted many of its wetlands into dairy pastures; associated stream quality degradation has occurred.

1b. Coastal Uplands

The Coastal Uplands ecoregion extends to an elevation of about 500 feet. The climate of Ecoregion 1b is marine-influenced and is characterized by an extended winter rainy season, sufficient fog during the summer dry season to reduce vegetal moisture stress, and a lack of seasonal temperature extremes. The ecoregion roughly corresponds with the historic distribution of Sitka spruce. The extent of the original forest has been greatly reduced by logging.

1d. Volcanics

The Volcanics ecoregion varies in elevation from 1,000 to 4,000 feet and is disjunct. Columnar and pillow basalt outcrops occur. Its mountains may have been offshore seamounts engulfed by continental sediments about 200 million years ago. The basaltic substrate preserves relatively stable summer stream flows that still support spring chinook salmon and summer steelhead. Its forests are intensively managed.

1f. Willapa Hills

The Willapa Hills ecoregion has erodible silt and clay soils. Drainage density is lower than in other parts of the Coast Range (1) that are also underlain by sedimentary rock. Industrial timberland has almost completely replaced the historic forests of the ecoregion.

1g. Mid-Coastal Sedimentary

The Mid-Coastal Sedimentary ecoregion is commonly underlain by massive beds of siltstone and sandstone. Its dissected, forested mountains are more rugged than in Ecoregion 1f and are prone to mass movement when the vegetal cover is removed. Stream gradients and fluvial erosion rates can be high.

1h. Southern Oregon Coastal Mountains

The Southern Oregon Coastal Mountains is a mountainous ecoregion with an ocean-modified climate. It is a transitional area between the Siskiyou Mountains and the Coast Range and is underlain by Jurassic sandstone, metamorphosed sediments, granite, and serpentine. Overall, the geology of Ecoregion 1h is complex, like that of the Siskiyou Mountains, but its mountains are lower and are not as dissected. The distributions of northern and southern vegetation blend together here and species diversity is high.

1i. Redwood Zone

The Redwood Zone is the northernmost tip of an ecoregion that extends to San Francisco Bay. Remnants of unlogged redwood forest survive east of Brookings. The redwood forest, when it

functioned as an intact ecosystem, moderated its own microclimate by entrapment of coastal fog and by shading.

2. PUGET LOWLAND

Ecoregion 2 is a broad rolling lowland that is characterized by a mild maritime climate. It occupies a continental glacial trough and is composed of many islands, peninsulas, and bays in the Puget Sound area. Coniferous forest originally grew on the ecoregion's ground moraines, outwash plains, floodplains, and terraces. The distribution of forest species is affected by the rainshadow from the Olympic Mountains.

2h. Cowlitz/Chehalis Foothills

The Cowlitz/Chehalis Foothills are rolling to steeply sloping. The potential natural vegetation, western hemlock and western red cedar forest, is similar to several other parts of the Puget Lowland (2). However, in contrast to much of the Puget Lowland (2), Ecoregion 2h was unaffected by continental glaciation.

3. WILLAMETTE VALLEY

Rolling prairies, deciduous/coniferous forests, and extensive wetlands characterized the pre-settlement landscape of this broad, lowland valley. Ecoregion 3 is distinguished from the adjacent Coast Range (1) and Cascades (4) by lower precipitation, less relief, and a different mosaic of vegetation. Landforms consist of terraces and floodplains that are interlaced and surrounded by rolling hills. Productive soils and a temperate climate make it one of the most important agricultural areas in Oregon.

3a. Portland/Vancouver Basin

The Portland/Vancouver Basin ecoregion is composed of undulating terraces and floodplains with numerous wetlands, oxbow lakes, and ponds. Historically, prairie and oak woodland grew on better drained sites while wetlands, Oregon ash, and Douglas-fir occurred elsewhere in the fault block basin. Today, Ecoregion 3a is dominated by urban and suburban development, pastures, and nurseries. Weather here is often affected by cold or warm easterly winds that blow through the Columbia River Gorge.

3b. Willamette River and Tributaries Gallery Forest

In the Willamette River and Tributaries Gallery Forest ecoregion, meandering, low-gradient channels and oxbow lakes are incised into broad floodplains. Deciduous riparian forests that once grew on its fertile, alluvial soils have been largely replaced by agriculture and rural residential, suburban, and urban development.

3c. Prairie Terraces

The undulating Prairie Terraces ecoregion is dissected by low-gradient, meandering streams and rivers. Its fluvial terraces once supported prairie and oak woodlands which were maintained by burning; Oregon ash and Douglas-fir occurred in wetter areas. Today, grass seed and grain crops are commonly grown.

3d. Valley Foothills

The Valley Foothills ecoregion is a transitional zone between the Willamette Valley, the Cascade Range, and the Coast Range. It has less rainfall than adjacent, more mountainous ecoregions and, consequently, its potential natural vegetation is distinct. Oregon white oak and

Douglas-fir were originally dominant but, today, rural residential development, woodland, pastureland, vineyards, tree farms, and orchards are common.

4. CASCADES

Ecoregion 4 is mountainous, underlain by Cenozoic volcanics, and has been affected by alpine glaciations. It is characterized by steep ridges and river valleys in the west, a high plateau in the east, and both active and dormant volcanoes. Elevations range upwards to 14,410 feet. Its moist, temperate climate supports an extensive and highly productive coniferous forest. Subalpine meadows occur at high elevations.

4a. Western Cascades Lowlands and Valleys

The Western Cascades Lowlands and Valleys ecoregion is characterized by a network of steep ridges and narrow valleys. Elevations are generally less than 3,200 feet and are the lowest in Ecoregion 4. The wet, mild climate promotes lush forests that are dominated by Douglas-fir and western hemlock. It is one of the most important timber producing areas in the Northwest.

4b. Western Cascades Montane Highlands

The Western Cascades Montane Highlands ecoregion is composed of steep, glaciated mountains that have been dissected by high-gradient streams. It has lower temperatures than Ecoregion 4a and is characterized by a deep annual snow pack. Soils are of the frigid and cryic temperature regimes and support forests dominated by Pacific silver fir, western hemlock, mountain hemlock, Douglas-fir, and noble fir.

4c. Cascade Crest Montane Forest

The Cascade Crest Montane Forest ecoregion consists of an undulating plateau punctuated by volcanic buttes and cones that reach a maximum elevation of about 6,500 feet. Its Pliocene and Pleistocene volcanics were glaciated and numerous lakes occur. The ecoregion is extensively forested with mountain hemlock and Pacific silver fir.

4d. Cascade Subalpine/Alpine

The Cascades Subalpine/Alpine ecoregion is an area of high, glaciated, volcanic peaks that rise above subalpine meadows. Elevations range from 5,600 to 12,000 feet. Active glaciation occurs on the highest volcanoes and decreases from north to south. The winters are very cold and the growing season is extremely short. Flora and fauna adapted to high elevations include herbaceous and shrubby subalpine meadow vegetation and scattered patches of mountain hemlock, subalpine fir, and whitebark pine.

4e. High Southern Cascades Montane Forest

The High Southern Cascades Montane Forest ecoregion consists of an undulating, glaciated plateau punctuated by volcanic buttes and cones. Maximum elevation is about 7,000 feet. Its mixed coniferous forest is dominated by mountain hemlock and Pacific silver fir. Grand fir, white fir, Shasta red fir, and lodgepole pine also occur and become more common toward the south and east. Ecoregion 4e tends to be drier than Ecoregion 4c and has longer periods of summer drought and more intermittent streams.

4f. Umpqua Cascades

The Umpqua Cascades ecoregion is a transitional zone between the lush and moister forests of Ecoregions 4a and 4b to the north and the drier forests of the Southern Cascades (4g) and the Klamath Mountains (78). Vegetation is a mix of grand fir, white fir, western hemlock, Pacific

silver fir, and Douglas-fir with Shasta red fir also occurring and becoming more common to the south. Vegetation diversity is greater than in Ecoregions 4a and 4b which have cooler summers.

4g. Southern Cascades

The Southern Cascades ecoregion is drier than other parts of the Cascades (4). It is characterized by gently sloping mountains, broad valleys, a long summer drought, and high vegetation diversity. White fir is common; at low elevations, Douglas-fir and ponderosa pine become prevalent and, at high elevations, Shasta red fir occurs.

9. EASTERN CASCADES SLOPES AND FOOTHILLS

Ecoregion 9 is in the rainshadow of the Cascade Mountains. Its climate exhibits greater temperature extremes and less precipitation than ecoregions to the west. Open forests of ponderosa pine and some lodgepole pine distinguish this region from the higher ecoregions to the west where hemlock and fir forests are common, and the lower, dryer ecoregions to the east where shrubs and grasslands are predominant. The vegetation is adapted to the prevailing dry, continental climate and is highly susceptible to wildfire. Volcanic cones and buttes are common in much of the region.

9b. Grand Fir Mixed Forest

The Grand Fir Mixed Forest ecoregion is mostly outside the limit of maritime climatic influence. It is characterized by high, glaciated plateaus and mountains, frigid soils, and a snow-dominated, continental climate. The vegetation is a mix of grand fir, Douglas-fir, and ponderosa pine.

9c. Oak/Conifer Eastern Cascades-Columbia Foothills

The Oak/Conifer Eastern Cascades Columbia Foothills ecoregion is more diverse than any other within the Eastern Cascade Slopes and Foothills (9). Soil, climate, and landforms are all highly variable and contribute to a mosaic of vegetation types that includes grasslands, oak woodlands, Douglas-fir/ponderosa pine forests, and western hemlock/Douglas-fir forests. Maritime weather systems sometime enter Ecoregion 9c via the Columbia River Gorge and moderate its otherwise continental climate.

9d. Ponderosa Pine/Bitterbrush Woodland

The Ponderosa Pine/Bitterbrush Woodland ecoregion is dominated by undulating volcanic plateaus and canyons. Its well-drained, frigid soils are often derived from ash and support nearly homogenous stands of ponderosa pine. Bitterbrush grows at lower elevations. Stands of lodgepole pines are largely absent in contrast to the Pumice Plateau Forest (9e) to the south.

9e. Pumice Plateau Forest

The Pumice Plateau Forest ecoregion is a high volcanic plateau that is thickly covered by Mt. Mazama ash and pumice. Its residual soils are highly permeable. Spring-fed creeks, marshes, and a few lakes occur. Forests of ponderosa pine are common on slopes; colder depressions and flats are dominated by lodgepole pine. Winters are consistently cold and precipitation falls mainly as snow. Summers tend to be mild.

9f. Cold Wet Pumice Plateau Basins

The Cold Wet Pumice Plateau Basins ecoregion includes Sycan Marsh, Klamath Marsh, and La Pine Basin. All three areas function as cold air catch-basins during the winter and have lower minimum temperatures than Ecoregion 9e. Its marshes and forested wetlands are commonly 4,500 to 5,000 feet in elevation and are important habitat for migratory waterfowl. The La Pine

Basin is underlain by thick lacustrine deposits that exhibit high ground water levels during the spring snow melt.

9g. Klamath/Goose Lake Warm Wet Basins

The Klamath/Goose Lake Warm Wet Basins ecoregion is drier than elsewhere in Ecoregion 9, yet it contains floodplains, terraces, and a pluvial lake basin. Its tule, sedge, and cattail wetlands have largely been drained for agriculture. Sagebrush and bunchgrass occur in upland areas.

9h. Fremont Pine/Fir Forest

The terrain of the Fremont Pine/Fir Forest ecoregion is composed of mountains and high plateaus. Its continental climate and diverse terrain support a range of vegetation types. Ponderosa pine woodlands are common at lower elevations while white fir is more prevalent in higher areas.

9i. Southern Cascade Slope

The Southern Cascades Slope ecoregion is a transitional zone between the Cascades (4) and the drier Eastern Cascade Slopes and Foothills (9). Forests of ponderosa pine blanket the mountainous landscape; white fir, Shasta red fir, and Douglas-fir grow at higher elevations. Much of Ecoregion 9i typically receives more precipitation than Ecoregions 9a, c, d, e, f, g, and j.

9j. Klamath Juniper/Ponderosa Pine Woodland

The terrain of the Klamath Juniper/Ponderosa Pine Woodland ecoregion consists of undulating hills, escarpments, and plateaus. Mean annual precipitation ranges from 12 to 20 inches. Reservoirs dot the landscape and are important to lowland irrigation. The natural vegetation was mostly juniper in the south and a mix of ponderosa pine and juniper in the north; today, a mosaic of pastures and woodland occurs.

10. COLUMBIA PLATEAU

Ecoregion 10 is an arid sagebrush steppe and grassland, surrounded on all sides by moister, predominantly forested, mountainous ecological regions. The Columbia Plateau (10) is underlain by basalt up to two miles thick. In its eastern portion, where precipitation amounts are greater, deep wind-deposited loess soils have been extensively cultivated for wheat.

10c. Umatilla Plateau

The treeless Umatilla Plateau ecoregion rises in step-like terraces to meet the forested Blue Mountains (11) to the south. At higher elevations, the deep loessial soils become thinner and rolling wheat fields are replaced by rangeland. Precipitation also increases with increasing elevation. Moisture levels are high enough to support grasses, such as bluebunch wheatgrass and Idaho fescue, without a sagebrush element. In the grassland to forest transition zone, shrubs such as hawthorne, rose, and snowberry occur. Ecoregion 10c has deeper soils and a higher stream density than the physiographically similar Deep Loess Foothills (10i).

10e. Pleistocene Lake Basins

The Pleistocene Lake Basins ecoregion once contained vast temporary lakes that were created by flood waters from glacial lakes Missoula and Columbia. In Oregon, the flood waters accumulated at the entrance to the Columbia Gorge and created ancient Lake Condon. Faint high water marks and shorelines, still visible between the 1,000 and 1,200 foot elevation contours, mark the margins of the former lake. Today, Ecoregion 10e is the driest area on the Columbia Plateau (10) and receives an annual average precipitation of only 6 to 12 inches.

Native vegetation consists of bluebunch wheatgrass and sagebrush. Major irrigation projects provide Columbia River water to Ecoregion 10e and have allowed the conversion of large areas of sagebrush to agriculture.

10g. Yakima Folds

The Yakima Fold belt is a series of unforested anticlinal ridges and synclinal valleys covering the western Columbia Plateau (10). Only the far eastern end of the ecoregion enters Oregon east of Wallula Gap on the Columbia River. The ridges are composed of layer upon layer of basalt up to 12,000 feet thick. Loess blankets the south-facing slopes and supports dryland wheat farming, while grazing occurs on steep, rocky north slopes. Located in the rain shadow of the Cascade Range, Ecoregion 10g receives little precipitation. Sagebrush and bunchgrass associations dominate plant communities outside of heavily farmed or grazed areas.

10i. Deep Loess Foothills

The Deep Loess Foothills ecoregion includes lower, northwest-facing slopes of the eastern Blue Mountains. Both Ecoregion 10i and the Palouse in Washington have highly-productive soil, equivalent average annual precipitation (16 to 23 inches), and similar land use capability. However, these areas differ in physiography and stream density. Instead of the dune-like ridges of the Palouse, the Deep Loess Foothills (10i) contain step-like terraced ridges that rise to the forested Blue Mountains. Ecoregion 10i also has more perennial streams than the Palouse; they are fed by the higher rainfall and snowpack that occurs in the Blue Mountains.

10k. Deschutes/John Day Canyons

The Deschutes/John Day Canyons ecoregion contains gorges that have been deeply cut into the basalt layers of the Columbia Plateau by river action. The canyons of Ecoregion 10k fragment the surrounding Umatilla Plateau (10c). The depth of the Deschutes/John Day Canyons (10k) create drier conditions than in the Umatilla Plateau (10c) and mean annual precipitation is about 10 inches. Vegetation is sparse on rocky, colluvial soils. It consists of bunchgrasses in steeper areas and sage and cheatgrass in grazed areas. Riparian vegetation in narrow reaches is often limited to a band of white alder at the water line. Elsewhere exotic alien plants, such as reed canarygrass, sweetclover, and Himalayan blackberry, dominate river edges.

11. BLUE MOUNTAINS

Ecoregion 11 is a complex of mountain ranges that are lower and much more open than the neighboring Cascades (4) and Northern Rockies (15). Like Ecoregion 4 but unlike Ecoregion 15, the Blue Mountains (11) ecoregion is mostly volcanic in origin. Only its highest ranges, particularly the Wallowa and Elkhorn Mountains, consist of intrusive rocks that rise above the dissected lava surface of the region. Much of Ecoregion 11 is grazed by cattle unlike the Cascades (4) and Northern Rockies (15).

11a. John Day/Clarno Uplands

The John Day/Clarno Uplands ecoregion is a ring of dry foothills that surround the western perimeter of the Blue Mountains. The "John Day Country", Ecoregion 11a, is a rough sea of highly dissected hills and palisades that are composed of colorful ash beds and cut by the valleys of the John Day and Crooked rivers. Potential natural vegetation includes bunchgrasses, sagebrush, and juniper. Juniper woodland has increased markedly over the last 50 years due to a combination of fire suppression, grazing pressure, and climatic factors. Irrigated pasture and alfalfa farming occur on alluvial flats along major drainages.

11b. John Day/Clarno Highlands

The John Day/Clarno Highlands ecoregion is an area of low mountains covered by dry ponderosa pine forest. The lower ecoregion boundary occurs in a transition zone between juniper and pine mixed woodland. Ecoregion 11b has a continental climate regime because the Cascade Range creates a barrier to the inland movement of marine weather systems. Precipitation is scant and there are wide extremes in annual and daily temperatures. Historically, widely-spaced trees with a grass or low shrub understory occurred and were subject to frequent low-intensity fires that reduced overall fuel loading. Today, after years of fire suppression and logging, the open canopy has been replaced by dense thickets of young growth that carry hot, stand-replacing fires.

11c. Maritime-Influenced Zone

The Maritime-Influenced Zone is that part of the Blue Mountains (11) that directly intercepts marine weather systems moving east through the break in the Cascades (4) at the Columbia River Gorge. Rain or snow events occur except in the summer. Loess soils are found at lower elevations near the Columbia Plateau (10) and have a moderately high water holding capacity. Moisture availability is sufficient to support forests at lower elevations than elsewhere in the Blue Mountains (11). A xeric forest of ponderosa pine and Douglas-fir occurs and has a dense and diverse shrub layer beneath it.

11d. Melange

The Melange ecoregion comprises the higher elevation core of the Blue Mountains (11), such as the Elkhorn, Vinegar, and Aldrich ranges. The name Melange refers to the complex geology, composed of limestones, mudstones, serpentines, metamorphic greenstones, schists, and granitic intrusions. Forest associations in this region are typically dominated by juniper, ponderosa pine, and Douglas-fir and are adapted to the metamorphic substrate and droughty soil. The region has a history of mining. Placer mining for gold has altered the structure of many streams. Present land use is mainly grazing; logging activity is limited by difficulty in reforestation of droughty exposed soils.

11e. Wallowas/Seven Devils Mountains

The Wallowas/Seven Devils Mountains ecoregion includes the highest ranges in the Blue Mountains and have a maximum elevation of about 9,800 feet. The mountains are composed of ocean sediments, such as limestone and mudstone, over a granitic core. Ecoregion 11e includes the sedimentary portions of the mountains below 4,000 feet that support a dry forest community. The character of the ponderosa pine and Douglas-fir forest varies between the moister maritime-influenced and drier continental areas, particularly in the diversity and extent of the shrub understory. Streams, following fault lines along steep gradients, have eroded deep canyons. Mountain water is diverted or impounded for human use. Land uses include grazing, logging, and recreation.

11f. Canyons and Dissected Highlands

The Canyons and Dissected Highlands ecoregion includes the eastern Blue Mountains, the eastern Wallowas, and isolated islands of uplifted Columbia Plateau that have been cut by the Snake River at Hells Canyon. Ecoregion 11f is on the lee side of the mountains and is drier than the marine-influenced Mesic Forest Zone (11i) that is found at similar elevations to the west. Its closed canopy forest is dominated by Douglas-fir that can withstand the difficult growing conditions and shifting colluvial soils of steep canyon slopes. Below about 4,500 feet elevation, the Douglas-fir forest of Ecoregion 11f changes abruptly to the grassland of the Canyons and Dissected Uplands (11g). Human activities are limited by the steep terrain of Ecoregion 11f.

11g. Canyons and Dissected Uplands

In the Canyons and Dissected Uplands ecoregion, deep river canyons divide the Blue Mountains from the Rocky Mountains. The Snake, Grande Ronde, Imnaha, and Salmon Rivers and their tributaries have cut the Columbia Plateau to depths of 2,000 to 5,000 feet. These canyons are cut through the same metasedimentary and metavolcanic rock that forms the Wallowa and Seven Devils; they differ from their lower stretches in Ecoregion 10I that are cut into basalt. The depth of the canyons and the exposed metamorphic rocks result in stony soils on canyon slopes that retain little moisture. Bluebunch wheatgrass, Sandberg's bluegrass, and spiny greenbush are adapted to grow under these hot, dry conditions. Land use includes grazing and recreation on National Forest land and in the Hells Canyon National Recreation Area.

11h. Continental Zone Highlands

The Continental Zone Highlands ecoregion is located in the southcentral and southeastern Blue Mountains (11). Low annual precipitation (16 to 30 inches), high evapotranspiration, abundant sunshine, and temperature extremes characterize the climate of Ecoregion 11h. Its few perennial streams flow south and end in the Harney Basin portion of the High Desert Wetlands (80e). Ecoregion 11h is underlain by Recent rhyolites and tuffs that differ from the Miocene basalt flows found to the north in the Columbia Plateau (10). Shallow, cobbly soils occur. The predominant vegetation is ponderosa pine with a xeric shrub or bunchgrass understory. Ecoregion 11h has no appreciable mesic forest zone in the upper elevations in contrast to other highland areas of the Blue Mountains (11).

11i. Continental Zone Foothills

The Continental Zone Foothills ecoregion includes the foothills bounding the southern perimeter of the Blue and Wallowa mountains and the western edge of the Idaho Batholith. The combined masses of the Cascade Range and the Blue Mountains to the northwest effectively block any marine-influence, creating a continental climate. The few perennial streams that occur originate in the surrounding mountain ranges. As a result, plant life experiences wide temperature ranges, high evapotranspiration, and high early season moisture stress. The dominant vegetation is a diverse desert shrub community that differs according to soil depth, texture, and elevation. The shrublands provide valuable winter habitat for wildlife.

11k. Blue Mountain Basins

The Blue Mountain Basins ecoregion includes the Wallowa, Grande Ronde, and Baker valleys. All three valleys are fault-bounded grabens or depressions; all are well-watered from surrounding mountains, and support irrigated alfalfa, pea, and commercial grass seed farming. The climate of the Wallowa and Grande Ronde valleys is moderated by a marine influence and receives an average annual precipitation of 13 to 24 inches. The Baker Valley is drier and more continental; it receives 9 to 16 inches per year. Most of the floodplain wetlands have been drained for pasture and hay, but a remnant exists in the Grande Ronde Basin at Ladd Marsh.

11l. Mesic Forest Zone

The Mesic Forest Zone is found between 4,000-7,000 feet in the western Wallowas, the western Seven Devils Mountains, and the higher elevation Blue Mountains. These areas are influenced by marine air coming through the Columbia River Gorge to the west. Much of the ecoregion's precipitation falls as snow that persists late into the spring. The soil has a significant ash layer that is relatively rock free and that also helps to retain moisture during the dry season. The result of these factors is a highly productive and diverse forest community that includes true firs and Engelmann spruce.

11m. Subalpine Zone

The Subalpine Zone includes the highest areas of the Elkhorn, Wallowa, Seven Devils, and Strawberry mountains beginning near tree line at an elevation of 6,500 feet, where the forest cover becomes broken by alpine meadows, and continuing through alpine meadowland to include the exposed rock, snowfields, and glacial ice of the highest mountain peaks. These areas characteristically have cold soil, deep snowpack, and a very short growing season. Forest species adapted to such conditions are subalpine fir, Engelmann spruce and whitebark pine. Historically, green fescue and sedges covered the high alpine meadows, but, following intense grazing pressure by sheep early in the 20th Century, many high elevation plant associations reverted to seral or exotic species.

11n. Deschutes River Valley

The Deschutes River Valley ecoregion is a broad, flat, predominantly basaltic valley wedged between the Blue Mountains and the Cascade Range. It is similar in climate and vegetation to the High Lava Plains (80g) south of the Blue Mountains, but its proximity to the mountains results in a much higher stream density and greater water availability. The core of the valley is the convergence of three major rivers: the Deschutes, Crooked, and Metolius. A system of canals carries the abundant river water to irrigated farms on floodplains and terraces. Potential natural vegetation includes bunchgrasses, Wyoming big sagebrush, and juniper.

12. SNAKE RIVER PLAIN

Ecoregion 12 is part of the xeric intermontane west. It is considerably lower and less rugged than surrounding ecoregions. Irrigation water is plentiful in many areas. Many of the alluvial valleys bordering the Snake River are in agriculture and principally grow sugar beets, potatoes, alfalfa, small grains, and vegetables. Cattle feedlots and dairy operations are also common in the river plain. The remainder of the plains and low hills in the ecoregion have a sagebrush steppe potential natural vegetation and are used for cattle grazing.

12a. Treasure Valley

The Treasure Valley ecoregion flanks the Snake and Malheur rivers and is underlain by Pleistocene alluvium, loess, lacustrine, and alluvial fan deposits. Most soils have an aridic moisture regime and irrigation is required to grow commercial crops. Many canals, reservoirs, and diversions are found in this portion of the Snake River Plain (12) and supply water to extensive pastureland and cropland as well as cities and industry. Water quality in many stream reaches has been significantly affected by channel alteration, dams, irrigation diversions, irrigation return flow, and urban, industrial, and agricultural pollution. Crops include wheat, barley, alfalfa, sugar beets, potatoes, beans, and some specialty crops. Population density is much greater than in neighboring, rangeland-dominated ecoregions. Potential natural vegetation is sagebrush and bunchgrass.

12j. Unwooded Alkaline Foothills

The Unwooded Alkaline Foothills ecoregion is shrub- and grass-covered. It is characteristically underlain by sandy, alkaline deposits from ancient Lake Payette which are absent from surrounding ecoregions. A few basalt outcrops also occur. Ecoregion 12j contains rolling foothills, hills, benches, alluvial fans, and scattered badlands that have been etched into lacustrine deposits. The terrain is higher and more rugged than the neighboring Treasure Valley (12a). Perennial streams are rare. Ecoregion 12j is valuable as rangeland and wildlife habitat. Land use is generally distinct from the irrigated agriculture of the neighboring Treasure Valley (12a). However, scattered areas near rivers or reservoirs that have enough water to leach out salts from the soil do support alfalfa or sugar beet farming. Potential natural vegetation is

saltbush-greasewood and sagebrush steppe; it is dominated by Wyoming big sagebrush, bluebunch wheatgrass, and salt tolerant shrubs, including black greasewood, four wing saltbush, and shadscale. Today, cheat grass and crested wheatgrass are also common. Plants including *Astragalus mulfordiae*, *Allium aaseae*, and *Hackelia cronquistii* grow in the sandy, alkaline, lake deposits of Ecoregion 12j and nowhere else.

13. CENTRAL BASIN AND RANGE

Ecoregion 13 is composed of northerly trending, fault-block ranges and intervening, drier basins. In the higher mountains, woodland, mountain brush, and scattered open forest are found. Lower elevation basins, slopes, and alluvial fans are either shrub- and grass-covered, shrub-covered, or barren. The potential natural vegetation is, in order of decreasing elevation and ruggedness, scattered western spruce-fir forest, juniper woodland, Great Basin sagebrush, and saltbush-greasewood. The Central Basin and Range (13) is internally-drained by ephemeral streams and once contained ancient Lake Lahontan. In general, Ecoregion 13 is warmer and drier than Ecoregion 80 and has more shrubland and less grassland than the Snake River Plain (12). Soils grade upslope from mesic Aridisols to frigid Mollisols. The land is primarily used for grazing. In addition, some irrigated cropland is found in valleys near mountain water sources. Only a small part of Ecoregion 13 extends into southeastern Oregon.

13h. Salt Desert Shrub Valleys

The Salt Desert Shrub Valleys ecoregion is composed of arid basins once inundated by ancient Lake Lahontan. Nearly flat basin floors are extensive and wetlands, terraces, and alluvial fans also occur. Strongly saline and very alkaline soils are characteristic and have an aridic moisture regime and a mesic temperature regime. Ecoregion 13h is dominated by black greasewood, inland saltgrass, alkali sacaton, basin wildrye along with spiny hopsage, budsage, and Wyoming big sagebrush. Soils, climate, and vegetation have strong affinities to the Central Basin and Range (13). Basin floors are poorly-drained and have a high water table. Land use is primarily rangeland and irrigated agriculture.

13j. Lahontan Playas

The Lahontan Playas ecoregion is nearly level, internally-drained, mostly barren, arid, and nonarable. It contains playas, salt flats, mud flats, and saline lakes and includes Alvord Playa in Oregon. Water levels and salinity fluctuate seasonally and yearly. Soils are mostly clayey and poorly-drained. Vegetation, where present, is sparse and composed of salt-tolerant plants such as salicornia and saltgrass.

78. KLAMATH MOUNTAINS

Ecoregion 78 is physically and biologically diverse. Highly dissected, folded mountains, foothills, terraces, and floodplains occur and are underlain by igneous, sedimentary, and some metamorphic rock. The mild, subhumid climate of the Klamath Mountains (78) is characterized by a lengthy summer drought. It supports a vegetal mix of northern Californian and Pacific Northwest conifers.

78a. Rogue/Illinois Valleys

The Rogue/Illinois Valleys ecoregion consists of floodplains and terraces that have a local relief of 100 to 600 feet. It is characterized by hot, dry summers and a native vegetation of Oregon white oak, madrone, California black oak, ponderosa pine, and grasslands. Today, a mix of orchards, cropland, pastureland, oak woodland, pine woodland, and rural residential

development occurs. Vegetation and land use are more similar to those of northern California's inland valleys than to those of the Willamette Valley (3).

78b. Siskiyou Foothills

The Siskiyou Foothills are affected by a Mediterranean climate that is similar to Ecoregion 78a. The driest area occurs east of Medford and is dominated by oak woodlands, ponderosa pine, and Douglas-fir. The wetter foothills adjacent to the Illinois Valley support Douglas-fir, madrone, and incense cedar.

78c. Umpqua Interior Foothills

The Umpqua Interior Foothills ecoregion is an intermingling of narrow valleys, terraces, and foothills. It contrasts with the terrain of the more mountainous Inland Siskiyou (78e). A mix of oak woodlands, Douglas-fir, ponderosa pine, and madrone intermingle with pastureland, vineyards, orchards, and row crops. The vegetation and land use are similar to those of Ecoregions 78a and 78b. Summers are hot and dry and, although the climate is transitional to both the Willamette and Rogue valleys, it is most similar to the Rogue Valley.

78d. Serpentine Siskiyou

The mountainous Serpentine Siskiyou ecoregion is highly dissected and is underlain by Jurassic serpentine. Rare understory species and sparse woodlands grow on its unique soils. Mining and associated water quality problems occur.

78e. Inland Siskiyou

The Inland Siskiyou ecoregion is mountainous. Granitic and sedimentary rock underlie the ecoregion and distinguish it from the volcanic mountains of the Cascades (4). Greater fire frequency, less annual precipitation, longer summer droughts, and a lack of tanoak differentiate it from the Coastal Siskiyou (78f).

78f. Coastal Siskiyou

The Coastal Siskiyou ecoregion has a wetter and a milder maritime climate than elsewhere in the Klamath Mountains (78). Productive forests composed of tanoak, Douglas-fir, and some Port Orford cedar cover the dissected, mountainous landscape.

78g. Klamath River Ridges

The Klamath River Ridges ecoregion has a dry, continental climate and receives, on average, 25 to 35 inches of rain annually. Low elevation and south-facing sites have a more drought resistant vegetation than elsewhere in the Klamath Mountains (78) such as juniper, chaparral, and ponderosa pine. Higher areas and north-facing slopes are covered by Douglas-fir, white fir, and Shasta red fir. Ecoregion 78g has less precipitation, more sunny days, and a greater number of cold, clear nights than the Inland Siskiyou (78e).

80. NORTHERN BASIN AND RANGE

Ecoregion 80 consists of dissected lava plains, rolling hills, alluvial fans, valleys, and scattered mountains. Mountains are less common in the west than in the east. Overall, it is higher and cooler than the Snake River Plain (12) and has more available moisture than the Central Basin and Range (13). Sagebrush steppe is extensive unlike in Ecoregion 13. Juniper-dominated woodland occurs on rugged, stony uplands. Much of Ecoregion 80 is used as rangeland. Cropland is found locally, but, in general, the Northern Basin and Range (80) is less suitable for agriculture than the Columbia Plateau (10) or the Snake River Plain (12). Ecoregion 80 occurs

in southcentral and southeastern Oregon beyond the extent of Pleistocene Lake Lahontan. Most of Ecoregion 80 in Oregon is internally drained but the eastern third is externally drained.

80a. Dissected High Lava Plateau

The Dissected High Lava Plateau ecoregion contains alluvial fans, rolling plains, hills, and shear-walled canyons cut into basalt. The potential natural vegetation is mostly sagebrush steppe but scattered woodlands are found on rocky and gravelly uplands. Mollisols are common and support bluebunch wheatgrass, Wyoming big sagebrush, black sagebrush, and scattered junipers. Most soils have a frigid temperature regime. Characteristically, Ecoregion 80a is externally drained in contrast to the High Lava Plains (80g) and the Central Basin and Range (13). A few intermittent lakes occur but are much less common than in Ecoregion 80g. Land use is primarily rangeland and wildlife habitat but some irrigated pastureland and cropland also occur.

80d. Pluvial Lake Basins

Water collects and evaporates on the Pluvial Lake Basins ecoregion in south central Oregon. Its basins or playas were vast lakes during the Pleistocene glacial period. They have cooler mean annual temperatures than the basins of the Central Basin and Range (13). The dry lake beds near the Cascade Mountains have a significant ash layer present. Sagebrush dominates in finely textured, well-drained soil, and greasewood grows in more alkaline soil. Alfalfa is grown on a limited basis in irrigated areas.

80e. High Desert Wetlands

The High Desert Wetlands ecoregion include Summer Lake, Warner Lakes, and Malheur Lakes. Ecoregion 80e holds water more consistently than the Pluvial Lake Basins (80d). Though water levels fluctuate from year to year, its lakes and wetlands provide critical habitat for both nesting and migratory birds as well as associated upland birds and mammals. Typical vegetation includes greasewood, saltgrass, and basin wildrye.

80f. Owyhee Uplands and Canyons

The Owyhee Uplands and Canyons ecoregion is characterized by its geological and geomorphological features that include deep, precipitous river canyons, barren lava fields, badlands, and ochre-colored tuffaceous outcrops that are riddled by caves. Landforms are more complex, lithology is more varied, stream density is higher, and water availability is greater in Ecoregion 80f than in the Dissected High Lava Plateau (80a). These characteristics, combined with its remote location, make the Owyhee Uplands and Canyons (80f) particularly valuable as refuge for wildlife. Potential natural vegetation consists of Wyoming big sagebrush, low sagebrush, Sandberg bluegrass, bluebunch wheatgrass, and Idaho fescue. It is similar to the vegetation of Ecoregion 80a but differs from the shadscale and desert shrubs of the nearby Unwooded Alkaline Foothills (12j).

80g. High Lava Plains

The vast High Lava Plains ecoregion is shrub-covered and has no outlet to the ocean. Its gently rolling terrain is punctuated by scattered volcanic cones and buttes. Streams are mostly intermittent. Ecoregion 80g differs from the Dissected High Lava Plateau (80a) because it is internally-drained; as a result, the fish assemblage of Ecoregion 80g lacks an anadromous component. The potential natural vegetation is mapped as sagebrush steppe; bluebunch wheatgrass is generally associated with Wyoming big sagebrush except in overgrazed areas where bunchgrasses have been depleted and replaced by cheatgrass.

80j. Semiarid Uplands

The Semiarid Uplands (80j) ecoregion covers disjunct areas across southeastern Oregon. It includes hills, low mountains, volcanic cones, buttes and rocky outcrops that rise from high lava plains as well as mid-elevation zones on more massive mountain ranges, such as the Owyhee and Steens mountains. Higher precipitation levels at these elevations support western juniper woodland with a sagebrush and Idaho fescue understory. The density and extent of juniper woodland varies with long term climate changes, grazing pressure, and fire suppression.

80k. Partly Forested Mountains

The high elevation, Partly Forested Mountains ecoregion is located in the western part of Ecoregion 80 and includes Steens Mountain. Similar areas occur in the higher portions of the Trout Creek and Pueblo Mountains along the border with Nevada but are too small to map at this scale. On the fault block of Steens Mountain, the gently sloping western flanks of Ecoregion 80k rise from 6,500 to 10,000 feet elevation before plunging downward over the eastern escarpment to the floor the Alvord Desert in Ecoregion 13h. In this elevation range, annual precipitation, up to 25 inches, is sufficient for mountain big sage, snowberry, mountain mahogany, and aspen groves.

Metadata for ORNHP / ODFW Ecoregions of Oregon

Contact: James S. Kagan, Oregon Natural Heritage Program (503) 731-3070

Description: This coverage includes the 10 ecoregions of Oregon. The coverage has been maintained by the Oregon Natural Heritage Program, and developed cooperatively with the Oregon Department of Fish and Wildlife. The 10 ecoregions that have been recognized by the Oregon Natural Heritage Program and the Oregon Department of Fish and Wildlife in Oregon are key to the Oregon Natural Heritage Plan, and the Wildlife Diversity Plan, and needed to be maintained. The 10 ecoregions were based on those originally published in *The Natural Vegetation of Oregon and Washington*, by J.F. Franklin and C.T. Dyrness in 1973.

This 2001 version uses the boundaries for the Oregon ecoregions developed by EPA staff in a cooperative, interagency process. Descriptions of the process, and ecoregions, are described in the following three publications:

- Bryce, Sandra A., Thor D. Thorson, Jimmy Kagan, Alan J. Woods, Chad McGrath, James M. Omernik, David E. Pater, and Jeffrey A. Comstock. In preparation. Ecoregions of Oregon intended for publication by the US Department of the Interior - Geological Survey.
- Clarke, Sharon E., and Sandra A. Bryce, eds., 1997, Hierarchical subdivisions of the Columbia Plateau and Blue Mountains Ecoregions, Oregon and Washington. Portland: U.S. Department of Agriculture-Forest Service General Technical Report PNW-GTR-395, 114 p.
- Pater, David.E., Sandra A. Bryce, Thor D. Thorson, Jimmy Kagan, Chris Chappell, James M. Omernik, Sandra H. Azevedo, and Alan J. Woods. 1998. Ecoregions of Western Washington and Oregon (2 sided color poster with map, descriptive text, summary tables, and photographs): Reston, Virginia, US Department of the Interior - Geological Survey (map scale: 1:1,350,000)*. ISBN 0-607-89571-3

Detailed metadata for the PNW cover, on which the ORNHP / ODFW ecoregions are based is included below. Briefly, a coverage was developed for the Pacific Northwest to identify Level III and Level IV Ecoregions. Whenever possible, the Level III Ecoregional Boundaries were used as the ecoregional boundaries in the ORNHP / ODFW coverage, and the ecoregions are quite similar. The differences are described below.

- 1) ORNHP / ODFW ecoregions are continuous. Therefore the two small isolated islands of West Cascades which occur in the East Cascades Level 3 region (the top of Black Butte and Paulina Peak) are absent. In the ORNHP Ecoregional coverage, these islands are included in the East Cascades.
- 2) For eastern Oregon, ORNHP / ODFW are not NOW recognizing two new ecoregions described in the new EPA – national ecoregion cover: the Snake River Plain and the Central Basin and Range. ORNHP and ODFW will examine including these when the Wildlife Diversity and Heritage Plans are next updated.
- 3) The Blue Mountains ecoregion is split by ODFW / ORNHP into two ecoregions, the Blue Mountains and the High Lava Plains. This division is longstanding, although the differences were not significant to be recognized at a national level.
- 4) The Northern Basin and Range has been split by ODFW / ORNHP into two ecoregions, the Basin and Range and the Owyhee Uplands. This split is also longstanding, with important management implications in Oregon. However, this split also was not nationally significant.

To split the two ecoregions, ORNHP used Level 4 ecoregional lines and ICBMP lines whenever possible. For portions of the split between the Owyhee Uplands and the Northern Basin and Range, the watershed line (between the internally drained Basins and the Owyhee Basin, draining into the Snake) was used. This is because the Basin and Range Ecoregion is Oregon's only entirely closed basin region, and the internal drainage was determined to be an important attribute to be considered. ORNHP new lines were digitized on screen in ARCVIEW, and converted into the coverage.

Oregon Natural Heritage Program / Oregon Department of Fish and Wildlife Ecoregion Descriptions

These were modified from the descriptions written by Bruce Taylor and Jimmy Kagan for the Oregon Biodiversity Project's book, *Oregon's Living Legacy*, 1998.

1 - Coast Range Ecoregion - CR

The Coast Range Ecoregion includes the entire Oregon coastline and the northern and central Oregon Coast Range Mountains, and extends north to the Olympic Peninsula of Washington and south almost to Mendocino, California. Elevations in the Oregon Coast Range Ecoregion range from sea level to 4,000 feet, and the marine climate creates the most moderate and wettest habitats in the state. Average annual precipitation of 60 to 180 inches supports spectacular stands of temperate rainforests. Vegetation is characterized by forests of Sitka spruce, western hemlock, Douglas fir and red alder.

The Oregon coast has other unique ecological features. Sand deposits from coastal streams and rivers (primarily the Umpqua and Columbia Rivers) have created major coastal dune systems, the largest located at the Oregon Dunes National Recreation Area. In the north coast, steep headlands and cliffs are separated by stretches of flat coastal plain and large estuaries. The south coast includes the warmest areas, with rugged headlands and very mild winters, supporting local endemic species such as the coast redwood and Port Orford cedar.

Almost 40% of the region is in public ownership, primarily in National Forest and State Forest lands. Population is dispersed in many small towns, most located within a few miles of the ocean. Forest products, tourism and fisheries are the mainstays of the local economy.

The Coast Range Ecoregion includes all of Oregon's coastal resources, including all of the intertidal, marine and estuarine cells. These resources are currently not well represented in Oregon's system of natural areas, nor are they as well understood as the terrestrial habitats.

2 - Willamette Valley Ecoregion - WV

The Willamette Valley Ecoregion is located between the Coast Range and the Western Cascades in northwestern Oregon and includes Oregon's largest river valley. From Oregon it extends north to include the Vancouver, Washington bottomlands. Broad, alluvial flats and low

basalt hills characterize the valley. Soils include deep alluvial silts from river deposits and dense heavy clays from pluvial deposits in the valley bottom's numerous oxbow lakes and ponds.

The abundant rainfall and fertile soils make the valley Oregon's most important agricultural region. This has been the case since the first settlers began arriving via the Oregon Trail. As a result, the Willamette Valley is Oregon's most altered ecoregion.

Originally, the valley was a mosaic of gallery riparian forests and wetlands, open white oak savannas and prairie, with valley margins of oak, ponderosa pine and Douglas fir woodlands. Native Americans maintained the prairies, oak savannas and woodlands by regularly burning most of the valley. With settlement, the prairies have been largely farmed and the open oak savannas and oak-conifer woodlands have been logged or become closed canopy forests.

The Willamette Valley is home to most Oregonians, with more than 70% of the state's population, the majority of its industry, and almost half of its farmland. It is also the fastest growing ecoregion, with the human population expected to double in the next 25 years.

The Willamette Valley's location on the Pacific Flyway makes it an important area for migrating and wintering waterfowl. Geese and shorebirds benefit from flooded agricultural lands, and the Willamette River and its many tributaries support salmon and steelhead runs, mostly of hatchery origin due to the large number of dams in the system. The valley's few remaining fragments of native prairie support many special plant species and endemic invertebrates, while the remaining wetlands provide habitat to the Oregon chub, the western pond turtle and many other sensitive animal species.

3 - Klamath Mountains Ecoregion - KM

The Klamath Mountains Ecoregion covers most of southwestern Oregon and northwestern California and includes the Siskiyou Mountains, California's Marble Mountains and Trinity Alps and the interior valleys and foothills between these mountain ranges. Elevations range from 100 to over 7,500 feet. Valley bottoms in the interior generally range between 450 feet elevation in the north around Roseburg to almost 2,000 feet at Ashland near the California border.

The ecoregion has the oldest landscapes in Oregon and is one of the few areas of the state not shaped largely by volcanism. It also is by far the most geologically diverse, having large areas of metamorphic and sedimentary rocks such as serpentine, limestone and gabbro, as well as granites and basalt. Topography ranges from steep, dissected mountains and canyons to gentle foothills and flat valley bottoms. The ecoregion also has major climatic extremes. Far western portions receive more than 100 inches of rain per year, with relatively mild temperatures year-round. The southern interior valleys are much drier, with locations receiving less than 20 inches of rain per year and summer high temperatures averaging more than 90 degrees F.

The combination of exceptional climatic, geologic, and topographic diversity supports the most diverse habitats in Oregon. In addition to diverse habitats, the Klamath Mountain Ecoregion is a floristic crossroads, including elements of the Sacramento Valley and the Sierra Nevada and Coast Range Mountains of California; the Cascade Mountains of Oregon and Washington; and the Great Basin.

Because of its geologic age, stable climate, and many unusual habitats, the ecoregion is a major center of species endemism for vascular plants. Of the 4,000 native plant species or subspecies occurring in Oregon, about half are found in this ecoregion, with about a quarter of these known only here. The region is also known for its diversity of conifers, with 30 different species. (In Oregon, the West Cascades has the second largest number of conifer species, with 18 species).

Prior to European settlement, the landscape was dominated by three major vegetation types — Douglas-fir forests, oak woodlands and ponderosa pine woodlands. Other significant communities include native grasslands and chaparral which dominated the presettlement valley bottoms, and Port Orford cedar forests, which have been decimated by logging and disease. All of the natural habitats have changed since fire suppression became effective in the early twentieth century. The region has a high frequency of dry, summer lighting storms, leading to natural fire frequency of less than 40 for most of the region, and closer to 20 years in the valleys and eastern portions of the region. Over fifty years of fire suppression have dramatically altered the ecology of the forests, savannas and shrublands in this region.

The human population of the ecoregion is concentrated in the valleys along the Interstate 5 corridor. Forest products, agriculture and tourism are the foundations of the local economy. The region is currently growing at a rate second only to the Willamette Valley.

4 - West Cascades Ecoregion - WC

The West Cascades Ecoregion extends from northern Washington south almost to the California border. This mountainous, heavily forested ecoregion is bounded on the west by the farms and woodlands of the Puget Trough and the Willamette Valley or the drier forests and valleys of the Klamath Mountains. To the east, it spills over the crest of the Cascade Mountains to the drier ponderosa pine forests of the East Cascades Ecoregion.

The crest of the Cascade Range is dominated by a series of volcanic peaks. In Oregon, Mount Hood is the highest at 11,240 feet, but a dozen others top 8,000 feet. The western slopes of the range feature long ridges with steep sides and wide, glaciated valleys. Most of the rivers draining the northern two-thirds of the ecoregion flow into the Willamette Valley and then to the Columbia River system; the southern third drains to the Pacific Ocean through the Umpqua and Rogue River systems. The climate varies with elevation and, to a lesser extent, latitude. Higher elevations receive heavy winter snows. The drier southern half has a fire regime similar to the Klamath Mountains, with frequent lightning-caused fires. In the northern half, the natural fire regime has historically produced less frequent but more severe fires.

The ecoregion is almost entirely forested and the flora and fauna are similar to that of the Coast Range Ecoregion. Douglas-fir-western hemlock forests dominate large areas up to elevations of about 3,300 feet. However, most of the previously-harvested forests of the lowlands and lower slopes now support mixed conifer-deciduous forests, with young Douglas-fir and western hemlock forests found in a mosaic with hardwood species such as bigleaf maple and red alder. Silver fir-mountain hemlock forests occur at mid-elevations. Silver fir, often referred to as a "subalpine forest," is common between 2,600 and 4,200 feet. Mountain hemlock is most common between 2,200 and 6,000 feet. In the higher areas, mountain hemlock or occasionally Alaska yellow cedar, subalpine fir, or whitebark pine woodlands open into alpine parklands with patches of forest interspersed with shrub and meadow communities. Alpine areas feature a

variety of habitats ranging from dwarf shrubs, grasses and forbs to wetlands and barren expanses of rocks and ice.

Forests have long been the foundation of the local economy in the West Cascades, and decades of logging put the region at the center of controversies over the northern spotted owl, logging of old growth forests and management of federal lands. Most of the ecoregion's population is found in small towns in the river valleys where increasing recreation use supplements the traditional timber-based economy.

5 - East Cascades Ecoregion - EC

The East Cascades Ecoregion is a transition zone that extends from below the crest of the Cascade Range east to where the ponderosa pine zone meets the sagebrush-juniper steppe. The ecoregion also extends north into Washington and south into California. In Oregon, the ecoregion is variable, including extensive lodgepole forests on deep Mazama ash, the montane and foothill Ponderosa pine forests, Klamath Basin lakes and wetlands, and many diverse montane forests.

The eastern slopes of the Cascades are drier than the Western Slopes, with annual rainfall ranging from 14-26 inches per year. The ecoregion is less steep and cut by fewer streams than the west side of the mountain range. It is also predominantly covered by conifer forests growing on volcanic soils. The northern two-thirds of the East Cascades is drained by the Deschutes River system, which includes a series of large lakes and reservoirs near its headwaters. The southern third is drained by the Klamath River, which flows south and west into California.

The Klamath Basin, which extends into the Modoc Plateau in California, is a broad, relatively flat mid-elevation valley that historically supported a vast expanse of lakes and marshes. Oregon's largest lake, Upper Klamath Lake, is the biggest remnant of this wetland system. Most of the basin's wetlands have been drained and converted to agriculture.

The mountains on the northern and eastern edges of the Klamath Basin lack a generally accepted name, but include a series of peaks and ridges extending from Paulina Peak near Bend southward through the headwaters of the Williamson, Sprague and Chewaucan rivers to the Warner Mountains east of Lakeview. These mountains are generally forested, but the valleys and flats between them include large marshes, irrigated meadows and pastures, and arid juniper and sagebrush steppes. These habitats are a critical part of the Pacific flyway, supporting vast number of shorebirds and waterfowl, the densest wintering concentration of bald eagles in the world, and many other wildlife species.

Also of ecological significance is the broad ecological zone found at the northern end of this region in Oregon, where the Columbia River Gorge created the only Oregon white oak zone in eastern Oregon - and a wealth of diversity. This Columbia Gorge transition zone, the extensive Ponderosa pine forests and woodlands, and the vast wetlands of the Klamath and upper Deschutes basin characterize this region.

The ecoregion's human population is concentrated in Hood River, Bend and Klamath Falls. Forest products, agriculture, recreation and tourism are the biggest contributors to local economies.

6 - Blue Mountains Ecoregion - BM

The Blue Mountains Ecoregion occupies nearly all of northeastern Oregon and extends into small portions of southern Washington and western Idaho. It encompasses three major mountain ranges—the Ochoco, Blue and Wallowa mountains. Landscapes include deep, rocky-walled canyons, glacially cut gorges, dissected plateaus, broad alluvial river valleys, and numerous mountain lakes, forests and meadows. Due to sharp elevational differences, the climate varies over broad temperature and precipitation ranges. Overall, the ecoregion is characterized by short, dry summers and long, cold winters.

The flora is intermediate between the east Cascades and the western Rocky Mountains of Idaho and Montana. Species composition changes with altitude. Sagebrush and grassland steppes dominate the entire eastern length of the region, stands of western juniper occur along the southern reaches, ponderosa pine woodlands are characteristic at mid-elevations and mixed coniferous forests dominate at higher altitudes. More than half the ecoregion is forested, but vast sections at all elevations are treeless due to dry conditions and the harsh climate. Extensive grasslands occur in and north of the Wallowa Mountains.

The region is thinly populated, with small towns in the major valleys and rural residents scattered throughout the smaller valleys among the mountains. Timber, ranching, agriculture and tourism provide the foundations for the local economy in most areas.

The diversity in elevation, soils and climate yields diverse habitats and many endemic plant species. The Wallowa Mountains alone have more than 10 plants species found nowhere else. Bighorn sheep, elk and large mammal populations here are among the largest in the state. The variety in habitats, including low, mid and high elevation grasslands, shrublands and forests results in this ecoregion having more habitat diversity than all but the Klamath Mountains Ecoregion. As a result, there are a correspondingly high number of ecosystem cells which follow.

7 - Basin and Range Ecoregion - BR

The Basin and Range Ecoregion includes much of southeastern Oregon's high desert and extends south into Nevada and extreme northeastern California. The ecoregion's name reflects its topography and geology, with numerous flat basins separated by isolated, generally north-south mountain ranges. Many of the mountains are fault blocks, with gradual slopes on one side and precipitous basalt rims on the other. In Oregon, elevations range from 4,100 feet in the lowest basin to more than 9,700 feet on Steens Mountain. Soils are generally rocky and thin, low in organic matter and high in minerals.

The climate is arid, with extreme ranges of daily and seasonal temperatures -- with the Alvord Desert (Oregon's driest location) receiving as little as 7 inches of rain annually. Runoff from precipitation and mountain snowpacks the basins often flows into flat, alkaline playas, where it forms seasonal shallow lakes and marshes.

Also known as the sagebrush desert or high desert, the Basin and Range Ecoregion contains many diverse habitats. The most significant of these are the sagebrush steppe types, salt desert scrub, riparian and wetland types, and mountain mahogany and aspen woodlands. The large wildlife refuges here support some of the largest populations of pronghorn antelope, white pelicans, and sage waterfowl, and are well known for their wildlife diversity.

Much of the ecoregion is uninhabited. The only towns with more than a few hundred residents are Burns and Lakeview, with populations of about 3,000 each. Livestock, agriculture and tourism are the foundations of the regional economy. Lumber production, formerly a major source of employment in the Burns and Lakeview areas, has declined with lower harvests on nearby national forests.

8 - High Lava Plains Ecoregion - HP

The High Lava Plains is the only ecoregion contained entirely within Oregon's borders. It is essentially a lava plateau dissected by canyons of the Deschutes, John Day and Crooked rivers. Elevations in most areas are between 3,500 and 4,500 feet, but range from as low as 1,400 feet in the Deschutes River canyon at Warm Springs to as high as 6,500 feet on higher basalt rims and buttes rising from the plateau.

The climate is arid, with 10-20 inches of precipitation per year. Although some of eastern Oregon's major rivers cross the Lava Plains, most of the water originates in adjoining ecoregions. Before the advent of modern reservoirs and irrigation systems, the plateau had no major lakes and few large wetlands.

Western juniper (*Juniperus occidentalis*) achieves its greatest dominance and diversity in this area, where it occurs in more than 30 plant communities. Before European settlement, basin big sagebrush, native grasslands and riparian woodlands were widespread in this region. Today, it is more common to find irrigated alfalfa, grains and mint occupying the region's valley bottoms and plains, while juniper has expanded into many former shrub-steppe vegetation types.

The ecoregion can be divided into three general sections: the western high plateaus, the John Day River basin and the upper Crooked River steppe. The western-most section, the plateau lands along the Deschutes and lower Crooked rivers between Bend and Madras, includes substantial areas that have been converted to irrigated agriculture and urbanization. Rapid population growth and increasing recreational uses have increased development pressures dramatically in the juniper woodlands and sagebrush steppes of this area. Agriculture and recreation are key components of an increasingly diversified economy.

The northeastern arm of the ecoregion extends from the sagebrush steppe and juniper-dominated hills east of the Deschutes plateau to the valleys along the main stem John Day River and the lower reaches of its north and south forks. Most of the bottomlands along the rivers have been converted to agriculture. Small communities along the John Day River are supported by agriculture, grazing, timber processing from the forests of the Ochoco and Blue Mountains and tourism.

The southeastern portion of the ecoregion, along the tributaries of the South Fork and mainstem Crooked River, is made up of more arid sagebrush steppe. Livestock grazing is the primary land use in this sparsely populated area.

9 - Owyhee Uplands Ecoregion - OU

The Owyhee Uplands Ecoregion covers the extreme southeast corner of Oregon, occupying the entire Owyhee River drainage, as well as the lower basin of the Malheur River. The ecoregion also extends into southwestern Idaho and northern Nevada.

The ecoregion has similar vegetation as the adjacent Basin and Range Ecoregion, but differs markedly in its terrain. The Owyhee Uplands landscape is basically a broad, undulating plateau cut by deep riverine canyons. Elevations range from 2,100 to 6,500 feet, with the average elevation of the plateau at about 4,000 feet.

The climate is one of extremes, with generally moist springs and cold winters bringing moisture in the form of snow, resulting in annual precipitation of only 8-12 inches. Summers are hot and dry with temperatures regularly exceeding 90° F, and the occasional thunderstorms producing more lightning than rain. The climate favors sagebrush steppe —the dominant vegetation type throughout the high deserts of the Intermountain West.

Another important influence in the ecoregion is the geology, which is mostly of volcanic origin. Over large portions of the landscape, soils have been derived from underlying layers of basalt and rhyolite, or occasionally from sedimentary layers that have been exposed by erosion. Of more interest than these "normal soils" are soils derived from volcanic ash and welded tuffs, which are found in distinct sites such as Leslie Gulch and Succor Creek near the Idaho border, or the extensive recent lava flows such as Jordan Craters or Saddle Butte Lava Field.

The weathering of the exposed volcanic ash has resulted in unique soils with a high clay content and an unusual chemical composition. The adaptational challenge these peculiar soils present for plants has given rise to a relatively rich flora of endemic species. The welded tuffs in these areas have also produced remarkable rock formations that rival more well-known erosional formations in the national parks of Utah's Colorado Plateau country.

Diverse sagebrush steppe communities dominate most of the ecoregion, including Wyoming big sagebrush, basin big sagebrush, mountain big sagebrush, silver sagebrush, black sagebrush, low sagebrush and rigid sagebrush communities. A few examples of salt desert scrub can be found, but these are much more prevalent in the Basin and Range Ecoregion. Mountain mahogany woodlands are very well developed, and the riparian habitats are very important to fish and wildlife, as they are in most arid regions of the west.

The ecoregion's population is concentrated in the northeastern corner, where irrigated agriculture in the fertile lowlands along the Snake and Malheur rivers is the foundation of the local economy. This area is occasionally considered part of a separate ecoregion called the Snake River Plains. In the remainder of the region, the economy is almost entirely based on local ranching.

10 - Columbia Basin Ecoregion - CB

The Oregon portion of the Columbia Basin Ecoregion (sometimes referred to as the Umatilla Plateau) extends from the eastern slopes of the Cascades Mountains south and east from the Columbia River to the Blue Mountains. The ecoregion also extends northward throughout most of eastern Washington, including a small portion of west central Idaho. The region includes the Columbia Basin proper, and the Palouse, which is recognized by many geographers as a separate region.

The Columbia River, with its historic floods and large deposits of loess (wind-borne silt and sand) from the end of the last ice age, has greatly influenced the region. Most of the Oregon portion of the ecoregion is a lava plateau broken by basalt canyons carved out by the Deschutes and John Day rivers and other streams that flow into the Columbia River. The climate is arid, with cold winters and hot summers. Most of the ecoregion receives less than 15 inches of precipitation per year (some areas as little as eight inches), much of that in the form of snow.

The majority of the ecoregion's natural vegetation is native bunchgrass prairie, often called Palouse prairie because of the deep, loess soils and plentiful bunchgrass. The majority of the ecoregion in Washington was originally sagebrush steppe. Sandy deposits along the Columbia River support open dunes, bitterbrush and steppe and western juniper. A few species of ground-squirrel and plants (milkvetch species among others) adapted to these habitats. The rivers are generally characterized by intermountain riparian vegetation, with black cottonwood, willows, chokecherry and aspen dominating riverbanks. Less common are riparian habitats dominated by black hawthorn and white alder.

Early travelers along the Oregon trail found vast natural grasslands broken by brushy draws and tree- and rimrock-bordered streams with numerous springs. Because of the deep loess soils, mild climate (due to low elevations) and the presence of adequate water (either from wells or from the Columbia, Snake and Umatilla rivers), much of this region provided model farmland. The human population is concentrated in the northeastern portion of the ecoregion, where Pendleton, Hermiston and other smaller communities serve as commercial centers for the agricultural economy.

The Columbia Basin Ecoregion is second only to the Willamette Valley in the percentage of landscape converted to non-native habitats and human uses. Protected areas and public lands are very limited in this region -- with the only vegetation types that have not declined dramatically found on lands that cannot be farmed: the steep canyon grasslands and scablands.

Metadata for TNC Ecoregions of Oregon

TNC Contact: Dan Dorfman (303) 541-0321

TNC US Ecoregions 2001, based on Bailey 1994, modified for TNC ecoregional planning purposes. The ecoregions generally correspond to Bailey's Provinces, although in Western Oregon they occasionally correspond to Sections. Their ecoregion codes (TNC_reg) and names (TNC_name) are:

<u>TNC_reg</u>	<u>TNC_name</u>
1	Pacific Northwest Coast
3	Puget Trough (= Puget – Willamette Valley – Georgia Basin)
4	West Cascades
9	Modoc Plateau (= Modoc Plateau – East Cascades)
10	Columbia Plateau
11	Blue Mountains Middle Roc (= Blue Mountains – Middle Rockies)
14	California North Coast
78	Klamath Mountains

Differences Between TNC and ORNHP / ODFW ecoregions for Oregon

For Oregon, Ecoregions 3, 4, 9, 10, 11, and 78 match the ORNHP / ODFW ecoregions, so the descriptions of the ecoregions correspond. The TNC Columbia Plateau ecoregion (# 10) includes 4 ORNHP / ODFW ecoregions: the Columbia Basin, the High Lava Plains, the Basin and Range, and the Owyhee Uplands. The Oregon Coast Range is largely identical, with the exception of a small portion of the California North Coast, which extends into Oregon to include the coastal fog belt, or the redwood belt.

TNC Created Metadata (without the spatial data that does not apply) follows:

Identification_Information:

Citation:

Citation_Information:

Originator: The Nature Conservancy - Conservation Science Division

Publication_Date: Unpublished Material

Publication_Time: Unknown

Title: TNC Ecoregions

Edition: 2000 B

Geospatial_Data_Presentation_Form: vector digital data

Series_Information:

Series_Name: Ecoregional Planning

Description:

Abstract: Ecoregions of the United States of America

Purpose: This data set was compiled for The Nature Conservancy's Ecoregional Planning purposes

Supplemental_Information: Originally based on Bailey, 1994, these boundaries have been extensively modified by TNC's ecoregional planning teams. Written justification for each modification is available through The Nature Conservancy's Ecoregional Planning Office.

Time_Period_of_Content:

Time_Period_Information:

Single_Date/Time:

Calendar_Date: 9/19/20

Time_of_Day: 4:00 PM

Currentness_Reference: publication date

Status:

Progress: Complete

Maintenance_and_Update_Frequency: Bi-annually

Spatial_Domain:

Bounding_Coordinates:

West_Bounding_Coordinate: -178.216553

East_Bounding_Coordinate: 178.606628

North_Bounding_Coordinate: 71.351440

South_Bounding_Coordinate: 18.925478

Keywords:

Theme:

Theme_Keyword_Thesaurus: ecosystem

Theme_Keyword: Ecoregion

Place:

Place_Keyword: U.S.

Access_Constraints: None, publicly available, freely distributable

Use_Constraints: intended for biodiversity conservation planning

Point_of_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization: The Nature Conservancy

Contact_Person: Dan Dorfman

Contact_Position: Western Regional GIS Manager

Contact_Address:

Address_Type: mailing and physical address

Address: 2060 Broadway, Suite 230

City: Boulder

State_or_Province: CO

Postal_Code: 80302

Country: USA

Contact_Voice_Telephone: 303-541-0321

Contact_Facsimile_Telephone: 303-449-4328

Contact_Electronic_Mail_Address: ddorfman@tnc.org

Hours_of_Service: 9-5 Rocky Mountain time

Contact_Instructions: please feel free to call

Data_Set_Credit: Western Conservation Science Center

Native_Data_Set_Environment: Windows NT Version 4.0 (Build 1381) Service Pack 5; ESRI
ArcInfo 8.0.345

EPA FGDC Metadata

The following is FGDC metadata prepared for the PNW Level 3 and Level 4 coverage. This coverage is the basis for the Oregon Ecoregional Cover. The only changes from the PNW cover were 1) the cover was reprojected from the Albers projection in which it was developed to the Oregon State GIS standard Lambert projection, 2) Oregon was clipped out, and 3) additional ORNHP attributes and lines were added, and 4) TNC attributes were added. The references

FGDC Metadata:

Identification_Information:

Citation:

Citation_Information:

Originator: A Woods (Dynamac), S Bryce (Dynamac), J Omernik (EPA) et al.

Publication_Date: unpublished

Publication_Time:

Title: Level III and IV Ecoregions of Oregon, Washington, and Idaho

Edition: 1

Geospatial_Data_Presentation_Form: map

Series_Name:

Issue_Identification:

Publication_Information:

Publication_Place:

Publisher:

Other_Citation_Details:

Online_Linkage:

Description:

Abstract:

Ecoregions denote areas of general similarity in ecosystems and in the type quality, and quantity of environmental resources. This map depicts revisions and subdivisions of ecoregions that was compiled at a relatively small scale (Omernik 1987). Compilation of this map, performed at the larger 1:250,000 scale, was part of a collaborative project between the United States Environmental Protection Agency, National Health and Environmental Effects Research Laboratory (NHEERL)- Corvallis, OR., the U.S. Forest Service, Natural Resources Conservation Service, Washington State Department of Natural Resources & the Oregon Natural Heritage Program. The ecoregions and subregion are designed to serve as a spatial framework for environmental resource management. The most immediate needs by the states are for developing regulations, biological criteria and water quality standards, and for setting management goals for nonpoint-source pollution. Explanation of the methods used to describe the ecoregions are given in Omernik (1995), Griffith et al. (1994), and Gallan et al. (1989). This map is a draft product of one of a few regional interagency collaborative projects aimed at obtaining consensus between the EPA, the NRCS, and the USFS regarding alignments of ecological regions.

Key words: ecoregions, ecosystems, resource management, regional geography

Purpose:

Assist managers of aquatic and terrestrial resources in understanding the regional patterns of the realistically attainable quality of these resources.

Supplemental_Information:

Procedures_Used:

- 1) All ecoregion and subregion delineations are digitized from the U.S.G.S. 1:250,000 base maps. Prior to digitizing each base map must be initialized to orient the map and relate it in geographic coordinates to the surface of the earth. When the registration tics are entered at the start of digitizing a transformation error of <0.003 must be achieved in order to insure a high level of registration accuracy. The person responsible for digital data entry completes a data sheet describing coverage name, date of entry, and whether a topology for the coverage is established.
- 2) After each 1:250,000 base map has been digitized, a topology for each coverage is established. This function creates unique identities for each polygon.
- 3) Next each base map is tested for polygon errors through an internal editing function. Errors are corrected for unlabeled polygons, unclosed polygons, or polygons with more than one label. Topology is reestablished for each coverage and tested again until no error are indicated.
- 4) The digital coverage is then plotted at the same scale as the original base map. This coverage is overlaid on a light table with the original and visually inspected for replication of original lines with digitized lines. Two individuals independently inspect the coverage for accuracy.

Revisions:

Revision 1. 9/95.

This coverage was appended from completed Level IV coverages in Oregon and Washington [Coast Range (completed 9/92), Blue Mountains and Columbia Plateau (7/95), Puget lowlands, Willamette Valley, Cascades, East Cascade Slope, North Cascades and Klamath Mountains ecoregions (6/95)]

2. 6/96 update coverage. delete 'hatched' areas. Consolidate all volcanics. updated lines per Sandy and Davids requests.

3. Revised level IV ecoregions in E. Oregon and E. Washington and added ecoregions for Idaho. 11/00

Reviews_Applied_to_Data:

Data was reviewed by David Pater, MERSC, 9/95.

Data was reviewed by David Pater, and Sandy Bryce, MERSC, 6/96.

Data was reviewed by Alan Woods, Dynamac, 11/00

Related_Spatial_and_Tabular_Data_Sets:

Other_References_Cited:

Gallant, A.L., T.R. Whittier, D.P. Larsen, J.M. Omernik, and R.M. Hughes. EPA/600/3-89/060. U.S. Environmental Protection Agency, Environmental Res Laboratory, Corvallis,OR. 152p.

Griffith, G.E., J.M. Omernik, and S.H. Azevedo. 1995 (Draft). Ecoregions subregions of Tennessee. U.S. Environmental Protection Agency, Environmental Research Laboratory, Corvallis, OR. 29p.

Griffith, G.E, J.M. Omernik, T.F. Wilton, and S.M. Pierson. 1994. Ecoregions of the Great Lakes. The Journal of the Iowa Academy of Sciences 101(1):5-13.

Omernik, J.M. 1987. Ecoregions of the conterminous United States. Map Sup.

Omernik, J.M. 1995. Ecoregions: A spatial framework for environmental management. In: Biological Assessment and Criteria: Tools for Water Resource Planning and Decision Making. W.S. Davis and T.P. Simon (eds.). Lewis Publishers, Boca Raton, FL. Pp. 49-62.

U.S. Environmental Protection Agency. 1995. Level III Ecoregions of the Continental United States, Map M-1 (revision of Omernik, 1987). Corvallis Environmental Research Laboratory, Corvallis, Oregon.

Wilken, E. 1986. Terrestrial ecozones of Canada. Environment Canada. Ecological Land Classification Series No. 19. Ottawa, Canada.

Notes:

Level IV ecoregion lines were delineated by Sandy Thiele and David Pater on the paper 1:250,000 maps using a relatively thick marking pen (Sharpie like). Digitizing was done directly off of paper. Coast Range was digitized by Sue Pierson, Ogden, 1992. Columbia Plateau was digitized by F. Faure, 1994, second revision digitized by S. Azevedo, 1995. Blue Mtns. were digitized by S. Azevedo, 1995. Puget lowlands, Willamette Valley, Cascades, East Cascade Slope, North Cascades and Klamath Mountains ecoregions were digitized by S. Azevedo, 1995.

Level IV ecoregions for central Oregon were revised and ecoregions were delineated for E. Oregon, E. Washington by Alan Woods and Sandy Bryce, Dynamac. Digitizing and map composition by Jeff Comstock, OAO, 11/00.

Time_Period_of_Content:

Time_Period_Information:

Single_Date/Time:

Calendar_Date: 9/95

Currentness_Reference:

Status:

Progress: Draft

Maintenance_and_Update_Frequency:

Spatial_Domain:

Bounding_Coordinates:

West_Bounding_Coordinate: -127.08565002

East_Bounding_Coordinate: -110.52669737

North_Bounding_Coordinate: 50.58573121
South_Bounding_Coordinate: 39.88846926
Keywords:
Theme:
Theme_Keyword_Thesaurus: None
Theme_Keyword: Level 4 ecoregions of Oregon, Washington, and Idaho
Place:
Place_Keyword_Thesaurus: None
Place_Keyword: Oregon, Washington, and Idaho
Stratum:
Stratum_Keyword_Thesaurus: None
Stratum_Keyword: None
Temporal:
Temporal_Keyword_Thesaurus: None
Temporal_Keyword: None
Access_Constraints:

Use_Constraints:

for use at 1:250,000 or smaller scales

Point_of_Contact:

Data_Set_Credit:

Security_Information:
Security_Classification_System: None
Security_Classification: Unclassified
Security_Handling_Description: None
Native_Data_Set_Environment: Windows_NT, 4.0, Intel NT, ARC/INFO version 8.0.2
Cross_Reference:
Citation_Information:
Originator:
Publication_Date:
Publication_Time:
Title: Level III and IV Ecoregions of Oregon, Washington, and Idaho
Edition:
Geospatial_Data_Presentation_Form:
Series_Information:
Series_Name:
Issue_Identification:
Publication_Information:
Publication_Place:
Publisher:
Other_Citation_Details:
Online_Linkage:

Data_Quality_Information:

Attribute_Accuracy:
Attribute_Accuracy_Report: See Entity_Attribute_Information
Quantitative_Attribute_Accuracy_Assessment:
Attribute_Accuracy_Value: See Explanation
Attribute_Accuracy_Explanation:

Attribute accuracy is described, where present, with each attribute defined in the Entity and Attribute Section.
Logical_Consistency_Report: Polygon and chain-node topology present.
Completeness_Report:

Positional_Accuracy:
Horizontal_Positional_Accuracy:
Horizontal_Positional_Accuracy_Report:

Vertical_Positional_Accuracy:
Vertical_Positional_Accuracy_Report:

Lineage: See also Supplemental_Information:

Source_Information:
Source_Citation:
Citation_Information:
Originator:
Publication_Date:
Title:
Source_Scale_Denominator: 250,000
Type_Of_Source_Media:
Source_Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar_Date:
Source_Currentness_Reference:
Source_Citation_Abbreviation:
Source_Contribution:

Spatial_Data_Organization_Information:
Direct_Spatial_Reference_Method: Vector
Point_and_Vector_Object_Information:
SDTS_Terms_Description:
SDTS_Point_and_Vector_Object_Type: Point
Point_and_Vector_Object_Count: 793
SDTS_Point_and_Vector_Object_Type: String
Point_and_Vector_Object_Count: 1860
SDTS_Point_and_Vector_Object_Type: GT-polygon composed of chains
Point_and_Vector_Object_Count: 793

Spatial_Reference_Information:
Horizontal_Coordinate_System_Definition:
Planar:
Map_Projection:
Map_Projection_Name: Albers Conical Equal Area
Albers_Conical_Equal_Area:
Standard_Parallel: 29.5
Standard_Parallel: 45.5
Longitude_of_Central_Meridian: -96
Latitude_of_Projection_Origin: 23
False_Easting: 0.00000

False_Northing: 0.00000
 Planar_Coordinate_Information:
 Planar_Coordinate_Encoding_Method: coordinate pair
 Coordinate_Representation:
 Abscissa_Resolution: 1.0
 Ordinate_Resolution: 1.0
 Planar_Distance_Units: METERS
 Geodetic_Model:
 Horizontal_Datum_Name: Unknown
 Ellipsoid_Name: Clarke 1866
 Semi-major_Axis: 6378206.4
 Denominator_of_Flattening_Ratio: 294.98

Entity_and_Attribute_Information:
 Detailed_Description:
 Entity_Type:
 Entity_Type_Label: ORWA_ECO_ALL.PAT
 Entity_Type_Definition: Polygon Attribute table
 Entity_Type_Definition_Source: 1:250,000 topo maps
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 Attribute_Label: -
 Attribute_Definition: Polygon Attribute table
 Attribute_Definition_Source: 1:250,000 topo maps
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 Enumerated_Domain_Value: -
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 Enumerated_Domain_Value_Definition_Source:
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 Attribute_Label: AREA
 Attribute_Definition: Area of poly/region in square coverage units
 Attribute_Definition_Source: Computed
 Attribute_Domain_Values:
 Enumerated_Domain:
 Enumerated_Domain_Value: Positive real numbers
 Enumerated_Domain_Value_Definition:
 Enumerated_Domain_Value_Definition_Source:
 Attribute:
 Attribute_Label: PERIMETER
 Attribute_Definition: Perimeter of poly/region in coverage units
 Attribute_Definition_Source: Computed
 Attribute_Domain_Values:
 Enumerated_Domain:
 Enumerated_Domain_Value: Positive real numbers
 Enumerated_Domain_Value_Definition:
 Enumerated_Domain_Value_Definition_Source:
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 Attribute_Label: ORWA_ECO_ALL#
 Attribute_Definition: Internal feature number
 Attribute_Definition_Source: Computed
 Attribute_Domain_Values:
 Enumerated_Domain:
 Enumerated_Domain_Value: Sequential unique positive integer
 Enumerated_Domain_Value_Definition:
 Enumerated_Domain_Value_Definition_Source:
 Attribute:

Attribute_Label: ORWA_ECO_ALL-ID
 Attribute_Definition: User-assigned feature number
 Attribute_Definition_Source: User-defined
 Attribute_Domain_Values:
 Enumerated_Domain:
 Enumerated_Domain_Value: Integer
 Enumerated_Domain_Value_Definition:
 Enumerated_Domain_Value_Definition_Source:
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 Attribute_Label: ECO
 Attribute_Definition: Level 4 ecoregion code
 Attribute_Definition_Source: 1:250,000 quad maps
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 Enumerated_Domain_Value: Numeric and Alphabetic characters
 Enumerated_Domain_Value_Definition:
 Enumerated_Domain_Value_Definition_Source:
 Attribute:
 Attribute_Label: HATCH
 Attribute_Definition: Indicates volcanics or rainshadow in Coast Range
 Attribute_Definition_Source: 1:250,000 topo maps
 Attribute_Domain_Values:
 Enumerated_Domain:
 Enumerated_Domain_Value: Positive real numbers
 Enumerated_Domain_Value_Definition:
 Enumerated_Domain_Value_Definition_Source:
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 Entity_Type_Definition: Arc attribute table
 Entity_Type_Definition_Source: 1:250,000 topo maps
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 Attribute_Label: -
 Attribute_Definition: Arc attribute table
 Attribute_Definition_Source: 1:250,000 topo maps
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 Enumerated_Domain_Value: -
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 Enumerated_Domain_Value_Definition_Source:
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 Attribute_Label: FNODE#
 Attribute_Definition: Internal number of from-node
 Attribute_Definition_Source: Computed
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 Enumerated_Domain_Value: Sequential unique positive integer
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 Enumerated_Domain_Value_Definition_Source:
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 Attribute_Label: TNODE#
 Attribute_Definition: Internal number of to-node
 Attribute_Definition_Source: Computed
 Attribute_Domain_Values:
 Enumerated_Domain:
 Enumerated_Domain_Value: Sequential unique positive integer
 Enumerated_Domain_Value_Definition:

Enumerated_Domain_Value_Definition_Source:
Attribute:
Attribute_Label: LPOLY#
Attribute_Definition: Internal number of poly to left of arc
Attribute_Definition_Source: Computed
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Enumerated_Domain:
Enumerated_Domain_Value: Sequential unique positive integer
Enumerated_Domain_Value_Definition:
Enumerated_Domain_Value_Definition_Source:
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Attribute_Label: RPOLY#
Attribute_Definition: Internal number of poly to right of arc
Attribute_Definition_Source: Computed
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: Sequential unique positive integer
Enumerated_Domain_Value_Definition:
Enumerated_Domain_Value_Definition_Source:
Attribute:
Attribute_Label: LENGTH
Attribute_Definition: Length of arc in coverage units
Attribute_Definition_Source: Computed
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: Positive real numbers
Enumerated_Domain_Value_Definition:
Enumerated_Domain_Value_Definition_Source:
Attribute:
Attribute_Label: ORWA_ECO_ALL#
Attribute_Definition: Internal feature number
Attribute_Definition_Source: Computed
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: Sequential unique positive integer
Enumerated_Domain_Value_Definition:
Enumerated_Domain_Value_Definition_Source:
Attribute:
Attribute_Label: ORWA_ECO_ALL-ID
Attribute_Definition: User-assigned feature number
Attribute_Definition_Source: User-defined
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: Integer
Enumerated_Domain_Value_Definition:
Enumerated_Domain_Value_Definition_Source:
Attribute:
Attribute_Label: LNTYPE
Attribute_Definition: Level III or level IV line
Attribute_Definition_Source: 1:250,000 topo maps
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: 111- level IV arc, 222- level III arc, 999-other
Enumerated_Domain_Value_Definition:
Enumerated_Domain_Value_Definition_Source:
Overview_Description:

Entity_and_Attribute_Overview:

ORWA_ECO.PAT

ECO - ecoregion ID code

- 1 Coast Range
 - 1a Coastal Lowlands
 - 1b Coastal Uplands
 - 1c Low Olympics
 - 1d Volcanics
 - 1e Outwash
 - 1f Willapa Hills
 - 1g Mid-Coastal Sedimentary
 - 1h Southern Oregon Coastal Mountains
 - 1i Redwood Zone
- 2 Puget Lowland
 - 2a Fraser Lowland
 - 2b Eastern Puget Riverine Lowlands
 - 2c San Juan Islands
 - 2d Olympic Rainshadow
 - 2e Eastern Puget Uplands
 - 2f Central Puget Lowland
 - 2g Southern Puget Prairies
 - 2h Cowlitz/Chehalis Foothills
 - 2i Cowlitz/Newaukum Prairie Floodplains
- 3 Willamette Valley
 - 3a Portland/Vancouver Basin
 - 3b Willamette River and Tributaries Gallery Forest
 - 3c Prairie Terraces
 - 3d Valley Foothills
- 4 Cascades
 - 4a Western Cascades Lowlands and Valleys
 - 4b Western Cascades Montane Highlands
 - 4c Cascade Crest Montane Forest
 - 4d Cascade Subalpine/Alpine
 - 4e High Southern Cascades Montane Forest
 - 4f Umpqua Cascades
 - 4g Southern Cascades
- 9 Eastern Cascade Slope and Foothills
 - 9a Yakima Plateau & Slopes
 - 9b Grand Fir Mixed Forest
 - 9c Oak/Conifer Eastern Cascades-Columbia Foothills
 - 9d Ponderosa Pine/Bitterbrush Woodland
 - 9e Pumice Plateau Forest
 - 9f Cold Wet Pumice Plateau Basins
 - 9g Klamath/Goose Lake Warm Wet Basins
 - 9h Fremont Pine/Fir Forest
 - 9i Southern Cascade Slope
 - 9j Klamath Juniper/Ponderosa Pine Woodland

- 10 Columbia Plateau
 - 10a Channeled Scablands
 - 10b Loess Islands
 - 10c Umatilla Plateau
 - 10d Okanogan Drift Hills
 - 10e Pleistocene Lake Basins
 - 10f Dissected Loess Uplands
 - 10g Yakima Folds
 - 10h Palouse Hills
 - 10i Deep Loess Foothills
 - 10j Nez Perce Prairie
 - 10k Deschutes/John Day Canyons
 - 10l Lower Snake and Clearwater Canyons
 - 10m Okanogan Valley

- 11 Blue Mountains
 - 11a John Day/Clarno Uplands
 - 11b John Day/ Clarno Highlands
 - 11c Maritime-Influenced Zone
 - 11d Melange
 - 11e Wallowas/Seven Devils Mountains
 - 11f Canyons and Dissected Highlands
 - 11g Canyons and Dissected Uplands
 - 11h Continental Zone Highlands
 - 11i Continental Zone Foothills
 - 11k Blue Mountain Basins
 - 11l Mesic Forest Zone
 - 11m Subalpine Zone
 - 11n Deschutes River Valley
 - 11o Cold Basins

- 12 Snake River Plain
 - 12a Treasure Valley
 - 12b Lava Fields
 - 12c Camas Prairie
 - 12d Dissected Plateaus and Teton Basin
 - 12e Upper Snake River Plain
 - 12f Semiarid Foothills
 - 12g Eastern Snake River Basalt Plains
 - 12h Mountain Home Uplands
 - 12i Magic Valley
 - 12j Unwooded Alkaline Foothills

- 13 Central Basin and Range
 - 13a Salt Deserts
 - 13b Shadscale-Dominated Saline Basins
 - 13c Sagebrush Basins and Slopes
 - 13d Woodland- and Shrub-Covered Low Mountains
 - 13e High Elevation Forested Mountains
 - 13f Moist Wasatch Front Foothills
 - 13g Wetlands
 - 13h Salt Desert Shrub Valleys
 - 13i Malad and Cache Valleys

- 15 Northern Rockies
 - 15a Grave Creek Range-Nine Mile Divide
 - 15b Camas Valley
 - 15c Flathead Valley

15d Tobacco Plains
 15e Flathead Hills and Mountains
 15f Grassy Potlatch Ridges
 15g Western Okanogan Semiarid Foothills
 15h High Northern Rockies
 15i Clearwater Mountains and Breaks
 15j Lower Clearwater Canyons
 15k Clark Fork Valley and Mountains
 15l Salish Mountains
 15m Kootenai Valley
 15n Weippe Prairie
 15o Coeur d'Alene Metasedimentary Zone
 15p St. Joe Schist-Gneiss Zone
 15q Purcell-Cabinet-North Bitterroot Mountains
 15r Okanogan-Colville Xeric Valleys and Foothills
 15s Spokane Valley Outwash Plains
 15t Stillwater-Swan Wooded Valley
 15u Inland Maritime Foothills and Valleys
 15v Northern Idaho Hills and Low Relief Mountains
 15w Western Selkirk Maritime Forest
 15x Okanogan Highland Dry Forest
 15y Granitic Selkirk Mountains

16 Idaho Batholith
 16a Eastern Batholith
 16b Lochsa Uplands
 16c Lochsa-Selway-Clearwater Canyons
 16d Dry, Partly Wooded Mountains
 16e Glaciated Bitterroot Mountains and Canyons
 16f Foothill Shrublands-Grasslands
 16g High Glacial Drift-Filled Valleys
 16h High Idaho Batholith
 16i South Clearwater Forested Mountains
 16j Hot Dry Canyons
 16k Southern Forested Mountains

17 Middle Rockies
 17d Eastern Gravelly Mountains
 17e Barren Mountains
 17f Crazy Mountains
 17g Absaroka-Gallatin-Madison-Bridger Sedimentary Mountains
 17h High Elevation Rockland Alpine Zone
 17i Absaroka-Gallatin Volcanic Mountains
 17j West Yellowstone Valley
 17k Lady of the Lake
 17l Gneissic-Schistose Forested Mountains
 17m Big Horn-Pryor Mountains
 17n Cold Valleys
 17o Partly Forested Mountains
 17p Foothill Potholes
 17q Big Snowy-Little Belt Carbonate Mountains
 17r Scattered Eastern Igneous-Core Mountains
 17s Bitterroot-Frenchtown Valley
 17t Limy Foothill Savanna
 17u Paradise Valley
 17v Big Belt Forested Highlands

17w Townsend Basin
17x Rattlesnake-Blackfoot-South Swan-Northern Garnet-Sapphire Mountains
17y Townsend-Horseshoe-London Sedimentary Hills
17z Tobacco Root Mountains
17aa Dry Intermontane Sagebrush Basins
17ab Dry Gneissic-Schistose-Volcanic Hills
17ac Big Hole
17ad Western Beaverhead Mountains
17ae Forested Beaverhead Mountains
17af Centennial Basin
17ag Pioneer-Anaconda Ranges
17ah Eastern Pioneer Sedimentary Mountains
17ai Elkhorn Mountains-Boulder Batholith
17aj Eastern Divide Mountains
17ak Deer Lodge-Philipsburg-Avon Grassy Intermontane Hills and Valleys
17al Southern Garnet Sedimentary-Volcanic Mountains
17am Flint Creek-Anaconda Mountains

18 Wyoming Basin
18a Rolling Sagebrush Steppe
18b Northern Semiarid Intermontane Basin
18c Wet Valleys
18d Semiarid Bear Hills

19 Wasatch and Uinta Mountains
19a Alpine Zone
19b Uinta Subalpine Forests
19c Mid-Elevation Uinta Mountains
19d Wasatch Montane Zone
19e High Plateaus
19f Semiarid Foothills
19g Mountain Valleys

20 Colorado Plateaus
20g Northern Uinta Basin Slopes

41 Canadian Rockies
41a Northern Front
41b Crestal Alpine-Subalpine Zone
41c Western Canadian Rockies
41d Southern Carbonate Front
41e Flathead Thrust Faulted Carbonate-Rich Mountains

42 Northwestern Glaciated Plains
42j Glaciated Northern Grasslands
42l Sweetgrass Uplands
42m Cherry Patch Moraines
42n Milk River Pothole Upland
42o North Central Brown Glaciated Plains
42p Foothill Grassland
42q Rocky Mountain Front Foothill Potholes

43 Northwestern Great Plains
43l Missouri Breaks Woodland-Scrubland
43m Judith Basin Grassland
43n Central Grassland

43o Unglaciaded Montana High Plains
43p Ponderosa Pine Forest-Savanna Hills
43r Pryor-Big Horn Foothills
43s Non-calcareous foothill grassland
43t Smith-Shield Valleys
43u Limy Foothill Grassland

77 North Cascades
77a North Cascades Lowland Forests
77b North Cascades Highland Forests
77c North Cascades Subalpine/Alpine
77d Pasayten/Sawtooth Highlands
77e Okanogan Pine/Fir Hills
77f Chelan Tephra Hills
77g Wenatchee/Chelan Highlands
77h Chiwaukum Hills and Lowlands
77i High Olympics

78 Klamath Mountains
78a Rogue/Illinois Valleys
78b Siskiyou Foothills
78c Umpqua Interior Foothills
78d Serpentine Siskiyou
78e Inland Siskiyou
78f Coastal Siskiyou
78g Klamath River Ridges

80 Northern Basin and Range
80a Dissected High Lava Plateau
80b Sagebrush Steppe- and Woodland-Covered Hills and Low Mountains
80c High Elevation Forests and Shrublands
80d Pluvial Lake Basins
80e High Desert Wetlands
80f Owyhee Uplands and Canyons
80g High Lava Plains
80h Saltbush-Dominated Valleys
80i Sagebrush Steppe Valleys
80j Semiarid Uplands
80k Partly Forested Mountains

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