



# Lower Owyhee Watershed Assessment

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## Appendix B. Descriptions of the ecoregions in different systems of classification

All descriptions are verbatim from the identified source. The descriptions from *The Ecological Provinces of Oregon* have material edited out, but no material added.

### A. Description of the NRCS common resource areas in the lower Owyhee subbasin

**10.1 – Central Rocky and Blue Mountain Foothills – Warm, Dry Blue and Seven Devils Mountains Foothills:** This unit lies between Oregon's Blue and Wallowa Mountains and the northwestern Snake River Plain. It is characterized by rangeland soils on hills and mountains associated with basalt and exposed tuffaceous sediment. The combined masses of the Cascade Range and the Blue and Wallowa Mountains block any maritime influence, creating a continental climate. As a result, plants are subject to a wide range in temperature, a high rate of evapotranspiration, and high early-season moisture stress. The dominant soils are those of the Brogan, Simas, Ruckles, and Ruclick series. The temperature regime is mesic, and the moisture regime is aridic. The mean annual precipitation is 9 to 12 inches. The vegetation is dominantly Wyoming big sagebrush and bluebunch wheatgrass (warm, dry climate).<sup>3</sup>

**10.16 – Central Rocky and Blue Mountain Foothills - Cool Moist Blue Mountain Foothills:** This unit is characterized by rangeland soils on hills and mountains associated with basalt. This unit is similar to the Lava Fields unit, but this unit receives more precipitation and has a xeric soil moisture regime. The dominant soils are those of the Ateron, Durkee, Menbo, Merlin, and Observation series. The temperature regime is frigid, and the moisture regime is xeric. The mean annual precipitation is 12 to 20 inches. The vegetation is dominantly mountain big sagebrush with Idaho fescue (cool, moist areas).<sup>2</sup>

**11.1 – Snake River Plains - Treasure Valley:** This unit is characterized by irrigated cropland, pastureland, and rapidly growing cities, suburbs, and industries. Many canals, reservoirs, and diversions are present. Aridic soils are dominant. Irrigation is required to grow commercial crops. Surface water quality has been significantly affected by channel alteration, dams, irrigation return flow, and urban, industrial, and agricultural pollution. Crops include wheat, barley, alfalfa, sugar beets, potatoes, and

beans. Crop diversity is greater, temperatures are warmer, and the mean frost-free season is longer on this unit than they are in other CRA units. Also, the population density is much higher than in nearby units that are dominantly rangeland.<sup>5</sup>

**11.7 – Snake River Plains - Dry Unwooded Alkaline Foothills:** The shrub- and grass-covered unwooded alkaline foothills unit is higher and more rugged than adjacent valley units. Alkaline lacustrine terrace deposits are in this unit, unlike in other units, and they support a unique flora. Shallow and moderately deep soils over a cemented pan are common. The potential natural vegetation is saltbush-greasewood and sagebrush steppe. Today, cheatgrass and crested wheatgrass also are common. This unit is used for livestock grazing.<sup>3</sup>

**23.2 - Malheur High Plateau - Cool High Desert Wetlands:** This unit is characterized by cold, wet basins that have a minimal amount of ash, if any. The unit is primarily in Harney Basin. The soils range from well drained to very poorly drained and from nonsaline and nonsodic to very strongly alkaline. Numerous ponded wetlands are present. The temperature regime is frigid, and the moisture regime is aridic with aquic soil conditions. The dominant soils are those of the Ausmus, Poujade, Widowspring, and Lawen series.<sup>2</sup>

**23.4 – Malheur High Plateau - High Lava Plains:** This unit is on basalt plateaus and the escarpments of fault block mountains. The temperature regime is frigid or mesic, and the moisture regime is primarily aridic. The soils are typically shallow or moderately deep to bedrock or a cemented pan and have a strongly developed argillic horizon. The vegetation is dominantly low sagebrush, Wyoming big sagebrush, Idaho fescue, Thurber needlegrass, and bluebunch wheatgrass. Playas, small intermittent lakes, and clay that has a high shrink-swell potential are common in depressions.<sup>3</sup>

**23.7 - Malheur High Plateau - Alluvial Fans and Pluvial Lake Terraces:** This unit is characterized by warm soils on lake terraces. Wetlands and saline-sodic soils are typically absent. The soils typically have a cemented pan within a depth of 40 inches, but they do not have bedrock within a depth of 60 inches. The temperature regime is mesic but near frigid, and the moisture regime is aridic. The dominant soils include those of the Deppy, McConnel, Spangenburg, and Norad series.<sup>4</sup>

**25.2 – Owyhee High Plateau - Dissected High Lava Plateau:** This unit consists of alluvial fans, rolling plains, and shear-walled canyons that are cut into extrusive rock. Sagebrush grassland is common, and scattered areas of woodland are on the rocky uplands. This unit supports cooler season grasses than do the valleys to the south, and it does not support saltbush and greasewood. Frigid and mesic Aridisols and Mollisols are in this unit. Grazing is the primary land use. Cropland is less common on this unit than it is on the Snake River Plain. High-quality water and native fish assemblages are in isolated canyons.<sup>4</sup>

**25.3 – Owyhee High Plateau - Owyhee Uplands and Canyons:** This unit contains deep, precipitous river canyons, barren lava fields, badlands, and tuffaceous outcroppings that are riddled by caves. The unit supports sagebrush grassland.<sup>3</sup>

## **B. Description of the Oregon Natural Heritage subregions in the lower Owyhee subbasin<sup>6</sup>**

**12. Snake River Plains:** 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.

**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.

**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.

## C. From the Ecological Provinces of Oregon<sup>1</sup>

**Snake River Ecological Province:** Snake River Province of Oregon is typified by extensive dissected terraces formed in ancient lakes. These terraces are

geologically eroded to the point that they appear as plateaus, basins, low rolling hills, and prominent hills separated by sharp dendritic drainage patterns. Mountainous terrain is interspersed throughout most of the province. Cedar Mountain and Owyhee Ridge just east of Owyhee Reservoir are rugged basaltic formations.

Alluvial valleys, which are used for irrigated agriculture, run along major watercourses. The soils formed on ancient terraces in Snake River Province vary considerably by location according to the terrace materials in which they were formed. The average annual precipitation is about 9.9 inches, of which only 28% occurs during the native-plant growing season, April through June. In terms of acreage, the vegetation of Snake River Province is primarily a shrub-grassland climax type.

**High Desert Ecological Province:** High Desert Province is characterized by innumerable large and small closed basins surrounded by extensive terraces formed in ancient lakes. Interspersed in this pattern of closed basins and terraces are low basaltic ridges, hilly uplands, [and] isolated buttes.

The terrace and basin portion of the province is flat to gently sloping. This is the part of Oregon that apparently was largely inundated by ancient lakes. Soils in the terraces and basins of High Desert Province were formed from parent materials mainly through water action. Average annual precipitation for the province is about 10 inches. High Desert Province in Oregon also is uniformly cold. Throughout High Desert Province, climate varies widely from locality to locality at any given time, both seasonally and from year to year, even though in general it is a uniformly dry climate with extremes of cold and hot.

**Owyhee Ecological Province:** Owyhee Province in the southeastern corner of Oregon comprises the western foothills and associated plains of the Owyhee Mountains, which are in southwestern Idaho. The north portion of the province in Oregon consists of lava fields, a few lake basins, and some mountainous areas lying south and east of the major Owyhee River canyon breaks.

Soils of Owyhee Province are related to very extensive basaltic uplands associated with the Owyhee Mountains in southwestern Idaho. The 22-year record at Danner shows an average annual precipitation of 10.6 inches of which 53% falls in winter (November through March) and 31% in the herbaceous native-plant growing season (April through June). In Oregon, vegetation associated with the extensive basaltic uplands of Owyhee Province is shrub-grassland climax type, i.e. with 10% or more natural canopy cover of shrubs.

## **D. Sources quoted in appendix B.**

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