

**Field Key to Ecological Systems and Target Alliances  
of Columbia Plateau and  
Parts of the Blue Mountains and Snake River Plain, United States  
Map Zones 8, 9 & 18**

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## Introduction

The following keys to NatureServe ecological systems and selected US-NVC vegetation alliances cover the areas found in NLCD map zones: 8, 9, and 18 (the Columbia Plateau and Parts of the Blue Mountains). The systems and alliances included in these keys are intended to represent the legend that LANDFIRE will be striving to map for existing vegetation in the northern Rockies (Figure 1). Some types are in the keys that characteristically occur at small spatial scales (generally <2 ha in size) and hence may not be mappable by the LANDFIRE project. However, we have chosen to be inclusive in the keys, so that the user will have information on these system types for comparison purposes. In some cases they may be important for modeling fire condition class and, given their relative distinctiveness on the landscape, they may indeed be mappable.

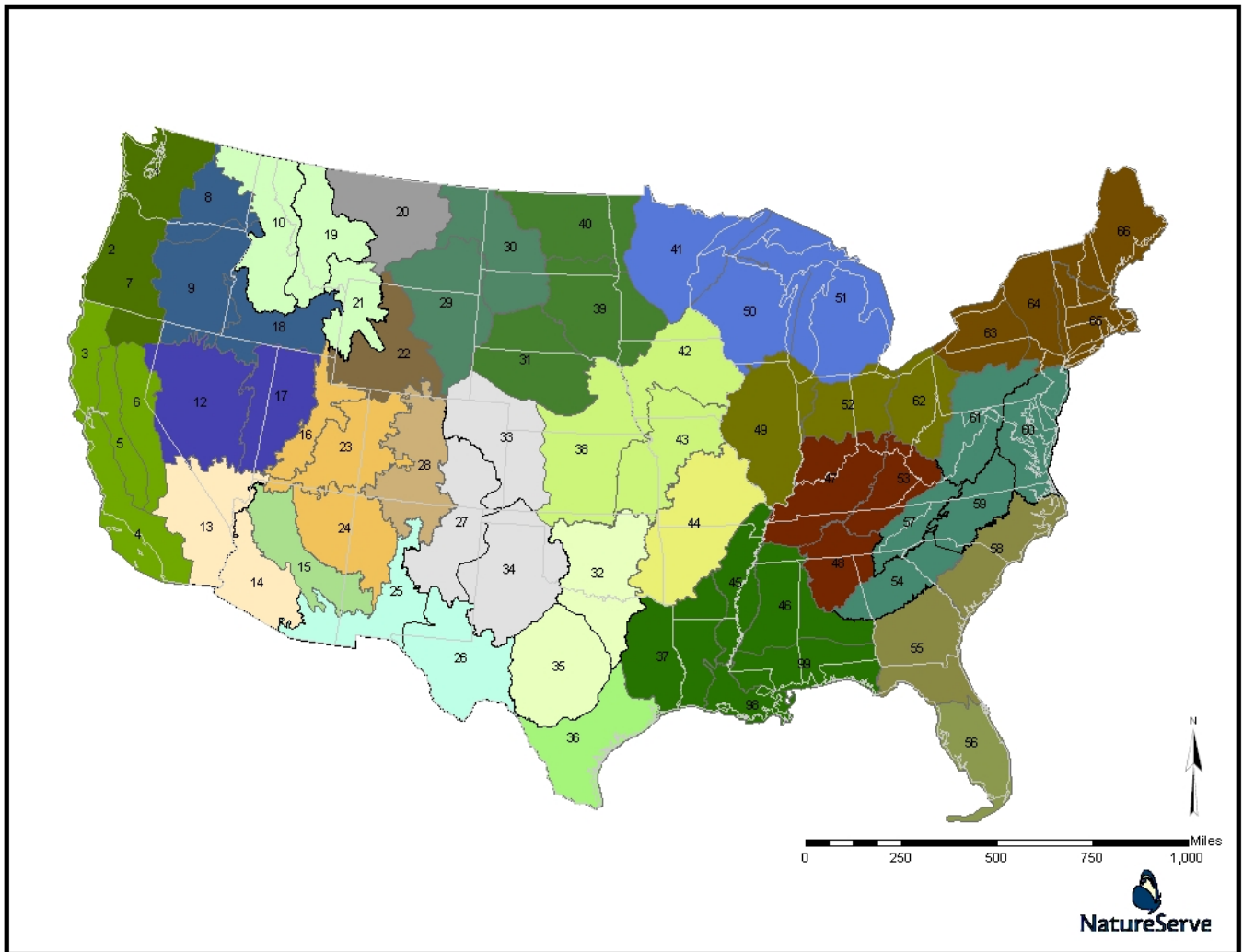
Plant names are almost always in Latin and follow the nomenclature of Kartesz (1999). In limited cases, we have included synonyms for some taxa.

The keys are “dichotomous”, which means the user follows the order of the ‘couplets’ and makes a choice between the 2 options represented in the couplet. The ordering of the couplets in each key does matter, and the user should choose the option in each couplet that best fits the data or field situation. A choice leads the user to the next couplet to be utilized in the keying process, via a number at the far right, or else leads to a final result (an ecological system type or an alliance).

If the choice the user makes leads to a “result”, then either an Ecological System is named or a Vegetation Alliance is named. If an ecological system is followed by a number in parentheses,

then the couplet so numbered is to alliances that are part of the system and which may be mappable. Alliances are recognizable because “alliance” is in the name, and they all start with one or more Latin names (e.g. *Pinus ponderosa* Woodland Alliance).

Systems do not include Latin species names in them, and always start with a Biogeographic region (e.g. Colorado Plateau Mixed Low Sagebrush Shrubland).



**Figure 1. LANDFIRE map zone clusters with keys to ecological systems and selected alliances.**

All the keys follow the same logic. First the user determines which Group Key: if the vegetation (or land cover) is ‘sparse’ (<10% vascular cover) (Key A); vascular cover >10% and woody cover >10% wetland or upland: woody wetlands/riparian areas (Key B); upland forest /woodlands (Key C); upland Shrublands (both tall, dwarf and shrub-steppe); or <10% woody cover, then Herbaceous Vegetation (Key E)

Keys are generally based on dominance within vegetation strata, with tree cover generally considered first, then that of shrubs, then the herbaceous component. Codominant species within a given strata are important as well, in some cases a system type or alliances will have 2 or more codominant species, which may or may not be present in all stands. Many ecological systems will have a variable physiognomy; where appropriate these variable systems have been placed into the keys in several places (i.e. some grassland systems have a “shrub-steppe” physiognomy and hence will be in the key both as shrub-steppe and herbaceous).

Some terminology is commonly employed throughout the keys that distinguish general spatial characteristics of the vegetation or environmental setting. For example ‘matrix’ types of vegetation are dominant across the majority of a given landscape, while ‘large patch’ types tend to occur as distinctive patches within the larger ‘matrix.’ Elevation-based life zones are commonly employed, with reference to ‘alpine,’ ‘subalpine,’ ‘montane,’ or ‘foothill’ zones. These zones vary in actual elevational thresholds across multiple map zones, and within individual map zones. More precise definition of these elevation breaks by map zone could be accomplished with additional research.

In the next section of the document we have provided a table showing the LANDFIRE legend units that represent non-natural vegetation and a short description for each of them. They are not formally incorporated into the keys, since they are typically recognizable without the use of a key, or else their floristic composition is so variable as to be not useful in a field key. Our primary purpose was to provide keys for the natural and near-natural vegetation of these zones.

## Land Use, Unvegetated, Semi-natural and Altered Vegetation

LAND USE OR UNVEGETATED SURFACES	
Open Water	Open water
Developed	Generally developed lands.
Developed, Open Space	Vegetation (primarily grasses) planted in developed settings for recreation, erosion control, or aesthetic purposes. Impervious surfaces account for less than 20% of total cover. Examples include parks, lawns, golf courses, airport grasses, and industrial site grasses.
Developed, Low Intensity	Includes areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 20-50% of total cover. These areas most commonly include single-family housing units.
Developed, Medium Intensity	Includes areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 50-80% of the total cover. These areas most commonly include single-family housing units
Developed, High Intensity	Includes highly developed areas where people reside in high numbers. Examples include apartment complexes, row houses and commercial/industrial. Impervious surfaces account for 80 to 100% of the total cover.
Agriculture	Generally developed for agricultural uses.

Pasture/Hay	These agriculture lands typically have perennial herbaceous cover (e.g. regularly-shaped plantings) used for livestock grazing or the production of hay. There are obvious signs of management such as irrigation and haying that distinguish it from natural grasslands. Identified CRP lands are included in this land cover type.
Cultivated Crops and Irrigated Agriculture	These areas used for the production of crops, such as corn, soybeans, small grains, sunflowers, vegetables, and cotton, typically on an annual cycle. Agricultural plant cover is variable depending on season and type of farming. Other areas include more stable land cover of orchards and vineyards.
<b>Perennial Ice/Snow</b>	
<b>SEMI-NATURAL / ALTERED VEGETATION</b>	
<b>Ruderal Vegetation</b>	Vegetation resulting from succession following significant anthropogenic disturbance of an area. It is generally characterized by unnatural combinations of species (primarily native species, though they often contain slight or substantial numbers and amounts of species alien to the region as well)
Ruderal Upland - Old Field	
Ruderal Upland - Abandoned Tree Plantation	
Ruderal Wetland	
<b>Introduced Vegetation</b>	Vegetation dominated by introduced species. These are spontaneous, self-perpetuating, and not (immediately) the result of planting, cultivation, or human maintenance. Land occupied by introduced vegetation is generally permanently altered (converted) unless restoration efforts are undertaken.
Introduced Upland Vegetation - Treed	Land cover is significantly altered/disturbed by introduced tree species.
Introduced Upland Vegetation - Shrub	Land cover is significantly altered/disturbed by introduced woody and/or herbaceous vegetation.
Introduced Upland Vegetation - Annual and Biennial Forbland	Land cover is significantly altered/disturbed by introduced annual and biennial forbs. Natural vegetation types are no longer recognizable. Typical species that dominate these areas are <i>Acroptilon repens</i> , <i>Leucanthemum vulgare</i> , <i>Cirsium arvense</i> , <i>C. vulgare</i> , <i>Euphorbia esula</i> , <i>Lepidium latifolium</i> , <i>Carduus nutans</i> , <i>Centaurea</i> spp. ( <i>diffusa</i> , <i>solstitialis</i> ), <i>Salsola kali</i> , <i>Bassia scoparia</i> , <i>Halogeton glomeratus</i> , <i>Melilotus officinalis</i> , and <i>Cardaria</i> spp.
Introduced Upland Vegetation – Annual Grassland	Land cover is significantly altered/disturbed by introduced annual grasses. Natural vegetation types are no longer recognizable. Typical species include <i>Bromus japonicus</i> , <i>B. rigidus</i> , <i>B. rubens</i> , <i>B. tectorum</i> , <i>Taeniatherum caput-medusae</i> , and/or <i>Schismus barbatus</i> .
California Annual Grassland	Land cover dominated by introduced, non-native annual grasses within the central valley and coastal portions of California. Natural vegetation types are no longer recognizable. Grass and forb species include <i>Bromus</i> spp. (e.g., <i>madritensis</i> , <i>diandrus</i> , <i>hordeaceus</i> ), <i>Eschscholzia californica</i> , <i>Aira caryophylla</i> , <i>Lasthenia</i> spp., <i>Castilleja</i> spp., <i>Avena</i> spp., <i>Mesembryanthemum</i> , <i>Malephora</i> , and/or <i>Carpobrotus</i> , commonly referred to as 'iceplant.' The native shrubs <i>Ambrosia chamissonis</i> , <i>Eriogonum latifolium</i> , and/or <i>Abronia latifolia</i> may be present as emergents. <i>Poa douglasii</i> may also be present.
Introduced Upland Vegetation - Perennial Grassland and Forbland	Land cover is significantly altered/disturbed by introduced, non-native perennial grasses and forbs. Natural vegetation types are no longer recognizable. Grass species include <i>Agropyron cristatum</i> , <i>Poa bulbosa</i> , <i>Bromus inermis</i> , <i>Phleum pratense</i> , and <i>Poa pratensis</i> . Forbs may include: <i>Centaurea</i> spp., <i>Cirsium arvense</i> , <i>Euphorbia esula</i> , <i>Lepidium</i> spp., <i>Melilotus</i> spp.
Introduced Riparian Vegetation	Land cover is altered/disturbed and dominated by introduced woody vegetation (woodlands and shrublands). Typical riparian trees and shrubs include <i>Elaeagnus angustifolia</i> , <i>Tamarix</i> spp., <i>Triadica sebifera</i> , etc.
Introduced Wetland Vegetation	Land cover is altered/disturbed and dominated by introduced wetland vegetation. Species may include <i>Lythrum salicaria</i> , <i>Phalaris arundinacea</i> , <i>Phragmites australis</i> , etc.
<b>Modified/Managed Vegetation</b>	Vegetation resulting from management or modification of natural/near natural; vegetation, but producing a structural and floristic combination not clearly known to have a natural analogue. Modified vegetation may be easily restorable by either management, restoration of ecological processes, and/or succession.
Modified/Managed Upland Vegetation	Land cover is apparently managed/modified and dominated by trees and/or shrubs. Vegetation is a mixture of herbaceous, shrub, and tree species.
Recently Burned Forest and Woodland	Land cover is apparently modified by recent fires which have burned forest and woodland vegetation. Vegetation is a mixture of herbaceous, shrub, and tree species.

Recently Burned Shrubland	Land cover is apparently modified by recent fires which have shrubland vegetation. Vegetation is a mixture of herbaceous and shrub species.
Recently Burned Grassland	Land cover is apparently modified by recent fires which have burned grassland vegetation. Vegetation is a mixture of herbaceous and shrub species.
Managed Tree Plantation	Land cover is apparently modified and appears as a managed tree plantation.
Recently Logged Timberland	Land cover is apparently modified and appears as logged timberland.
Modified/Managed Wetland Vegetation	These areas include created and obviously managed wetlands of varying size resulting from water diversion. Artificial Wetlands will be mapped where obvious built structures may be distinguished from imagery.

## **Key to Ecological Systems and Target Alliances of the Columbia Plateau and parts of the Blue Mountains**

This key is intended for identifying Ecological Systems and selected alliances that are found in the Columbia Plateau of eastern Washington and Oregon and the Snake River Plain of southern Idaho. It includes the Blue Mountains of Northwestern Oregon, extreme southeastern Washington and central western Idaho. Additional alliance couplets are to proposed mappable or target alliances and are not intended to be comprehensive (e.g. not all vegetation alliances are included in the keys).

### **Please note the following symbols:**

\* indicates NS ecological system that has been grouped into broader LANDFIRE Map Unit.

Included to help clarify key, but crews need to record broader LANDFIRE Map Unit(\*\*)

\*\* indicates broader LANDFIRE Map Unit.

\*\*\* small patch ecological system, NOT being mapped by LANDFIRE.

\*\*\*\* This alliance is not considered mappable, but is included as a counter-point to one that is mappable.

### **KEY TO GROUPS**

- 1a. Total woody canopy cover generally less than 10% .....2
- 1b. Total woody canopy cover generally 10% or more .....3
  
- 2a. Total canopy cover (woody and herbaceous vascular plants) generally less than 10%..... **Key A**
- 2b. Total canopy cover (herbaceous) >10%, some woody species may be present .....5
  
- 3a. Land cover is restricted to drainages, potential inundated valley floors, semi-riparian flats, riparian areas, springs or seeps (flat, depressional or slope) and areas with high water tables, including ephemeral washes and saline to semi-saline flats (wetlands, seeps, riparian areas, washes, poorly drained lake beds)..... **Key B**
- 3b. Land cover is upland, sloping or flat, but without a high water table, no potential for flooding, a water shedding, not water receiving site .....4
  
- 4a. Land covered in trees, from savannas (10-25% cover of trees, generally >3 m tall with a single main stem and >25% cover graminoids), to woodlands (25-60%) or forests (60-100%) ..... **Key C**
- 4b. Land covered in shrubs, tall or dwarf, at least 10% cover woody vegetation, scattered trees may be present, these less than 10%, and clearly not a savanna..... **Key D**
  
- 5a. Total canopy cover (herbaceous) generally 10% or more ..... **Key E**
- 5b. Total canopy cover of vascular plants is less than 10% cover ..... **Key A**

### **KEY A: SPARSELY VEGETATED (<10% vascular cover)**

- 1a. Barren and typically sparsely vegetated alpine substrates.....2
- 1b. Barren and sparsely vegetated substrates NOT alpine .....4
  
- 2a. Land cover is ice or exposed rock (usually >90% cover of either bedrock, boulders or scree).....3
- 2b. Land cover has significant amounts (10-50% cover) of vascular herbaceous vegetation (typically dominated by cushion plants) and exposed rock (50-90% cover). Sites are windswept by prevailing winds and snow does not remain long (in Map Zone 9 only, limited to highest areas in the Blue Mountains) .....  
..... **Rocky Mountain Alpine Fell field**

- 3a. Land cover is mostly exposed rock (usually >90% cover of either bedrock, boulders or scree). Nonvascular cover (lichens) may be significant, at alpine elevations ..... **(Rocky Mountain Alpine Bedrock and Scree\*)**  
..... **Rocky Mountain Alpine/Montane Sparsely Vegetated Systems\*\***
- 3b. Land cover is mostly exposed rock, below upper tree line, not alpine.....4
- 4a. Land cover is volcanic in origin (includes lava, cinder, ash deposits).....5
- 4b. Land cover is not volcanic in origin.....6
- 5a. Volcanic substrates (generally <10% plant cover) such as basalt lava (malpais), basalt dikes with associated colluvium, basalt cliff faces and uplifted "backbones," cinder cones or cinder fields.....  
Primarily in, but not limited to, Map Zones 9 & 18.....  
..... **(Inter-Mountain Basins Volcanic Rock and Cinder Land\*)**  
Primarily in, but not limited to, Map Zone 8..... **(North Pacific Volcanic Rock and Cinder Land\*)**  
..... **Inter-Mountain Basins Sparsely Vegetated Systems\*\***
- 5b. Highly eroded volcanic ash and tuff. Landforms are typically rounded hills and plains that form a rolling topography. .... **(Columbia Plateau Ash and Tuff Badland\*)**  
..... **Inter-Mountain Basins Sparsely Vegetated Systems\*\***
- 6a. Steep cliff faces, narrow canyons or small rock outcrops, or the talus slopes at the base of cliffs.....7
- 6b. Land surface is not bedrock, cliff faces but loose, shifting or eroding materials finer than talus and if so , not directly below a cliff face .....8
- 7a. Steep cliff faces, narrow canyons, or smaller rock outcrops of various igneous, sedimentary, and metamorphic bedrock types. Also included are unstable scree and talus slopes that typically occur below cliff faces, at high montane altitudes (>1800 m) (5900 ft) in the Blue Mountains.....  
..... **(Rocky Mountain Cliff, Canyon and Massive Bedrock\*)**  
..... **Rocky Mountain Alpine/Montane Sparsely Vegetated Systems\*\***
- 7b. Steep cliff faces, narrow canyons, or smaller rock outcrops of various igneous, sedimentary, and metamorphic bedrock types. Also included are unstable scree and talus slopes that typically occur below cliff faces, at montane altitudes and lower (<1800 m) (5900 ft), including Hell's Canyon, and elsewhere not in the Blue Mountains . .... **(Inter-Mountain Basins Cliff and Canyon\*)**  
..... **Inter-Mountain Basins Sparsely Vegetated Systems\*\***
- 8a. Land is eroded shale, clay hills or shifting or stabilized sand hills/dunes .....9
- 8b. Not as above.....10
- 9a Land cover is eroded shale or clay hills ..... **(Inter-Mountain Basins Shale Badland\*)**  
..... **Inter-Mountain Basins Sparsely Vegetated Systems\*\***
- 9b. Land is active or stabilized dunes and sandsheets. Species are adapted to shifting, coarse-textured substrates (usually quartz sand) and form patchy or open grasslands, shrublands or steppe, and occasionally woodlands, in a predominantly barren landscape..... **(Inter-Mountain Basins Active and Stabilized Dune\*)**  
..... **Inter-Mountain Basins Sparsely Vegetated Systems\*\***  
Isolated small patch wetlands within dunes ..... **Inter-Mountain Basins Interdunal Swale Wetland\*\*\***
- 10a. Land is an ephemeral stream bed or playa lake, subject to flooding or inundation (maybe very infrequent) .....11
- 10b. Land cover is barren, but not as above (review land use and disturbed classes) ..... **(Undifferentiated Barren\*)**  
..... **Inter-Mountain Basins Sparsely Vegetated Systems**
- 11a. Flat large lake beds that are sparsely vegetated playas (generally <10% plant cover). Salt crusts are common throughout, with small saltgrass beds in depressions and sparse shrubs around the margins. These systems are intermittently flooded. The water is prevented from percolating through the soil by an impermeable soil subhorizon and is left to evaporate. .... **(Inter-Mountain Basins Playa\*)**  
..... **Inter-Mountain Basins Sparsely Vegetated Systems**
- 11b. Intermittently flooded streambeds and banks often lined with shrubs such as *Sarcobatus vermiculatus*, *Ericameria nauseosa*, *Fallugia paradoxa*, and/or *Artemisia cana ssp. cana* Shrubs form a continuous or intermittent linear canopy in and along drainages but do not extend out into flats. Typically it includes



patches of saltgrass meadow where water remains for the longest periods. Soils are generally less alkaline than those found in the Inter-Mountain Basins Playa system. .... **(Inter-Mountain Basins Wash\*)**  
 ..... **Inter-Mountain Basins Sparsely Vegetated Systems**

Note: Invasive, exotic shrubs shrub as *Tamarix* spp. may be present to dominant in these washes where disturbed ..... See **Invasive Riparian Woodland and Shrubland**

**KEY B: WOODY WETLAND / RIPARIAN / EPHEMERAL WASH / LAKEBED**  
**(>10% woody cover, wet areas)**

- 1a. Land cover is restricted to drainages, potential inundated valley floors, semi-riparian flats, riparian areas, springs or seeps (flat, depressional or slope) and areas with high water tables .....2
- 1b. Land cover is upland vegetation without seeps or high water tables ..... **Key C**
- 2a. Higher elevation woodlands and shrublands generally >2600 m (8530 ft) (upper montane-subalpine-alpine) .....3
- 2b. Middle and lower elevation (generally <2600 m, <8530 ft) woodlands and shrublands (lower montane to valley floor) .....5
- 3a. High elevation woodlands .....4
- 3b. High elevation shrublands restricted to drainages, stream terraces, semi-riparian flats and spring or seep fed slopes. Can be quite swampy or boggy. Above 2500 m (8530 ft) in elevation, restricted to the Blue Mountains. Species of *Salix*, *Alnus* or *Betula* are commonly present.....  
 ..... **(Rocky Mountain Subalpine - Montane Riparian Shrubland\*)**  
 ..... Possibly on the western edge of Map Zones 8 & 9 **(North Pacific Shrub Swamp\*)**  
 ..... **Rocky Mountain Subalpine/Upper Montane Riparian Systems\*\***
- 4a. Well drained soils of drainages, steam terraces, semi-riparian flats and spring or seep fed slopes. If dominated by conifers than site is well drained, soils that may remain wet seasonally, but are rarely saturated year-round, never boggy or anoxic .....  
 ..... **(Rocky Mountain Subalpine - Montane Riparian Woodland\*)**  
 ..... **Rocky Mountain Subalpine/Upper Montane Riparian Systems\*\***
- 4b. Poorly drained soils saturated year-round or with seasonal flooding in the spring. These are primarily on flat to gently sloping lowlands, but also occur up to near the lower limits of continuous forest (below the subalpine parkland). Soils are poorly drained, mucky areas, and areas are often a mosaic of moving water and stagnant water. Soils can be woody peat, muck or mineral but tend toward mineral. ....  
 ..... **Northern Rocky Mountain Conifer Swamp\*\***
- 5a. Lower montane – foothill woodlands and shrublands restricted to drainages, semi-riparian flats and spring or seep fed slopes, generally reliant on perennial source of water .....6
- 5b. Lower elevation areas, lower foothills to primarily valley bottom shrublands restricted to temporarily flooded drainages and flats .....9
- 6a Lower elevation riparian areas and seeps in the foothills of the Blue Mountains or Rocky Mountains, restricted to the northern and eastern portions of Map Zones 8 & 9 and the northern portions of Map Zone 18. Distinguishing species (from the next) include *Betula papyrifera*, *Picea* spp., *Pinus contorta*, *Populus angustifolia*, *Populus tremuloides*, *Pseudotsuga menziesii*, *Thuja plicata*, *Tsuga heterophylla*, *Alnus incana*, *Athyrium filix-femina*, *Cornus sericea*, *Dryas drummondii*, *Equisetum arvense*, *Gymnocarpium dryopteris*, *Rhamnus alnifolia*, *Oplopanax horridus*, and *Populus angustifolia* .....  
 ..... **(Rocky Mountain Lower Montane Riparian Woodland and Shrubland\*)**  
 ..... **Rocky Mountain Montane Riparian Systems \*\***
- 6b. Lower elevation riparian areas and seeps in the foothills and canyons along streams within the Columbia River Basin, or tributaries into the Great Basin, not in the Blue Mountains on Rocky Mt foothills or other wise not as above .....7

7a. Sagebrush dominated stream terraces, and other low areas with high water tables at least part of the year. Dominated by *Artemisia cana* ssp. *bolanderi* or *Artemisia cana* ssp. *viscidula* are dominant, with *Artemisia tridentata* ssp. *tridentata*, *Artemisia tridentata* ssp. *wyomingensis*, or *Artemisia tridentata* ssp. *vaseyana* occasionally codominant. .... **Columbia Plateau Silver Sagebrush Seasonally Flooded Shrub-Steppe\*\*\***

7b. Not dominated by sagebrush ..... **8**

8a. Lower elevation riparian areas and seeps in the foothills and canyons along streams within the Columbia River Basin at and below lower tree line, found throughout most of Map Zones 8, 9 and 18. Distinguishing species include *Alnus rhombifolia*, *Alnus rubra*, *Betula occidentalis*, *Crataegus douglasii*, *Celtis laevigata* var. *reticulata*, *Frangula purshiana*, *Fraxinus*, *Pinus monticola*, *Pinus ponderosa*, *Philadelphus lewisii*, *Populus balsamifera* ssp. *trichocarpa*, *Populus fremontii*, *Populus acuminata*, *Pseudotsuga menziesii*, *Salix amygdaloides*, *Salix eriocephala*, *Salix exigua*, *Salix lasiolepis*, *Salix lemmonii*, *Salix lucida* ssp. *lasiandra*, and *Salix lutea* ..... **(Columbia Basin Foothill Riparian Woodland and Shrubland \*\*)**  
..... **Inter-Mountain Basins Montane Riparian Systems\***

8b. Streams draining into the Great Basin and along the eastern slope of the Sierra Nevada within a broad elevation range from about 1220 m (4000 feet) to over 2135 m (7000 feet)..... **(Great Basin Foothill and Lower Montane Riparian Woodland and Shrubland\*)**  
..... **Inter-Mountain Basins Montane Riparian Systems\*\***

9a. Woodlands and or shrublands restricted to drainages and semi-riparian flats that are dominated by introduced species ..... **10**

9b. Woodlands and shrublands of drainages, valley floors, semi –riparian flats dominated (at least 50% by native species)..... **11**

10a. Woodlands restricted to drainages and semi-riparian flats that are dominated by introduced species *Elaeagnus angustifolia* ..... **(Elaeagnus angustifolia Semi-Natural Woodland Alliance\*)**  
..... **Invasive Riparian Woodland and Shrubland\*\***

10b. Woodlands and shrublands restricted to drainages and semi-riparian flats that are dominated by *Tamarix* spp. .... **(Tamarix spp. Semi-Natural Temporarily Flooded Shrubland Alliance\*)**  
..... **Invasive Riparian Woodland and Shrubland\*\***

11a. Shrublands of moderate to heavily saline basins ..... **12**

11b. Riparian/wetland woodlands and shrubland not like above ..... **13**

12a. Open to moderately dense shrublands dominated or codominated by *Sarcobatus vermiculatus* that are widespread in the Intermountain Basins region but restricted to valley bottoms in Southern Rocky Mountains, such as the San Luis Valley in Colorado. *Atriplex canescens*, *Atriplex confertifolia*, or *Krascheninnikovia lanata* may be present to codominant with patches of *Distichlis spicata* grasslands. Commonly occurs on saline/alkaline plains and basins, sometimes encircling playas or on stream terraces..... **Inter-Mountain Basins Greasewood Flat**

12b. Open to moderately dense shrublands dominated by one or more species of *Atriplex* and/or *Krascheninnikovia lanata*. *Sarcobatus vermiculatus* is absent or has low cover. Other shrubs present to codominant include *Artemisia tridentata* ssp. *wyomingensis*. Typical of saline basins, alluvial slopes and plains across the Intermountain western U.S. extending into the Great Plains..... **Inter-Mountain Basins Mixed Salt Desert Scrub**

13a. Stands dominated by *Acer grandidentatum* ..... **Rocky Mountain Bigtooth Maple Ravine Woodland**

13a. Stands dominated by Sagebrush ..... **14**

14a. Sagebrush dominated stream terraces and other low areas with high water tables at least part of the year. Dominated by *Artemisia cana* ssp. *bolanderi* or *Artemisia cana* ssp. *viscidula* are dominant, with *Artemisia tridentata* ssp. *tridentata*, *Artemisia tridentata* ssp. *wyomingensis*, or *Artemisia tridentata* ssp. *vaseyana* occasionally codominant. .... **Columbia Plateau Silver Sagebrush Seasonally Flooded Shrub-Steppe\*\*\***

14b. Not dominated by sagebrush ..... **15**

- 15a. Wooded wetland surrounding and shading a herbaceous emergent wetland. These pools have trees directly adjacent that provide shade and influencing the hydrology. Tree species can be conifers such as *Abies grandis*, *Abies lasiocarpa*, *Larix occidentalis*, *Picea engelmannii*, *Pinus contorta*, *Pseudotsuga menziesii* or broadleaf trees such as *Populus balsamifera ssp. trichocarpa*, *Populus tremuloides* or *Betula papyrifera*. Herbaceous species include *Carex vesicaria* or *Phalaris arundinacea*. This is a rare wooded vernal pool currently known only from the Swan Valley, MT, but may occur elsewhere in Idaho. ....  
 ..... **Northern Rocky Mountain Wooded Vernal Pool\*\*\***
- 15b. Wooded wetland not like any of the above ..... **Undescribed or otherwise not included in this Key**

### KEY C: UPLAND FORESTS AND WOODLANDS

- 1a. Broadleaf forests and woodlands or mixed conifer-aspen forests and woodlands (deciduous trees make up 25-100% of the tree canopy). .... **2**
- 1b. Conifer forests and woodlands (deciduous trees may make up less than 25% cover of the tree canopy)..... **6**
- 2a. Broadleaf forest or woodland typically dominated by *Populus tremuloides* singly or mixed with conifers ..... **3**
- 2b. *Populus tremuloides* not present, broadleaf forest or woodland dominated by *Acer grandidentatum* or *Cercocarpus ledifolius* ..... **4**
- 3a. Broadleaf forest or woodland typically dominated by *Populus tremuloides* (and possible inclusions of other broadleaf tree species) with less than 25% total tree canopy cover by conifers .....  
 ..... **Rocky Mountain Aspen Forest and Woodland**
- 3b. Mixed conifer-broadleaf forests and woodlands codominated by *Populus tremuloides* and conifer trees with 25-75% relative tree canopy of each canopy type. These mixed stands will commonly occur in relatively small areas ..... **Inter-Mountain Basins Aspen-Mixed Conifer Forest and Woodland**
- 4a. Broadleaf forest or woodland (or really tall shrubs) dominated by *Acer grandidentatum*, often in a ravine or draw, generally restricted to southern Idaho..... **Rocky Mountain Bigtooth Maple Ravine Woodland**
- 4b. Broadleaf forest, woodland or shrubland dominated by *Cercocarpus ledifolius* ..... **5**
- 5a. Low stature (<1.5 m) woodland and/or shrublands dominated by *Cercocarpus ledifolius* (see note following couplet). *Artemisia tridentata ssp. vaseyana*, *Purshia tridentata*, with species of *Arctostaphylos*, *Ribes*, or *Symphoricarpos* are often present. Throughout the intermountain west, often as small patches in forested landscapes. .... **Inter-Mountain Basins Mountain Mahogany Woodland and Shrubland**
- 5b. Tall stature (>2 m) woodlands dominated by *Cercocarpus ledifolius* (see note following couplet). If other tree species present than, *Cercocarpus* must have at least 50% relative cover. *Juniperus occidentalis*, *Juniperus osteosperma*, *Juniperus scopulorum*, or *Pinus monophylla* may be present (if conifer cover exceeds 15% relative cover, key via conifer dominated system). Stands tend to be unburned and not browsed, slightly more mesic, found in higher elevations than above ...*Cercocarpus ledifolius* **Woodland Alliance**  
**Note:** If you can key to subspecies:  
*Cercocarpus ledifolius* var. *intercedens* small trees 4-5 m tall—mappable Woodland Alliance  
*Cercocarpus ledifolius* var. *ledifolius* shrublands to 1.5 m tall—shrublands  
*Cercocarpus intricatus* (= *Cercocarpus ledifolius* var. *intricatus*) shrublands to 1.5 m tall—shrublands
- 6a. Subalpine conifer forests, woodlands or parklands ..... **7**
- 6b. Montane and foothills conifer forests and woodlands..... **11**
- 7a. Stunted tree clumps, open woodlands, and herb- or dwarf-shrub-dominated openings, occurring above closed forest ecosystems and below alpine communities. .... **8**
- 7b. Subalpine conifer forests and woodlands NOT dominated or codominated by *Pinus albicaulis* and/or *P. flexilis*, forming true subalpine forests below tree line, dominated by *Picea engelmannii* and/or *Abies lasiocarpa*..... **9**

8a. Tree clumps dominated by <i>Pinus albicaulis</i> , woodlands of <i>Pinus albicaulis</i> or <i>Larix lyallii</i> . <i>Abies lasiocarpa</i> may also be present .....	<b>Northern Rocky Mountain Subalpine Woodland and Parkland</b>
8b. Tree clumps and woodlands dominated by <i>Pinus flexilis</i> .....	<b>Rocky Mountain Subalpine-Montane Limber-Bristlecone Pine Woodland</b>
9a. Conifer forests and woodlands strongly dominated by <i>Pinus contorta</i> . <i>Populus tremuloides</i> , <i>Abies lasiocarpa</i> and <i>Picea engelmannii</i> may be present, but are generally <25% of tree canopy.....	<b>10</b>
9b. Conifer forests and woodland strongly dominated by <i>Abies lasiocarpa</i> and/or <i>Picea engelmannii</i> (singly or together). Other conifers may be present, but are not >25% of the tree canopy.....	<b>11</b>
10a. Subalpine forests, occasionally found in the montane zone, where the dominance of <i>Pinus contorta</i> is related to topo-edaphic conditions and nutrient-poor soils, such as excessively well-drained pumice deposits, glacial till and alluvium on valley floors where there is cold-air accumulation, warm and droughty shallow soils over fractured quartzite bedrock, and shallow moisture-deficient soils with a significant component of volcanic ash .....	<b>Rocky Mountain Poor Site Lodgepole Pine Forest</b>
10b. Conifer forests and woodlands strongly dominated by <i>Pinus contorta</i> (>2/3 total tree canopy), site characteristics not as above, typically early to mid-seral forest on productive soils .....	<b>Rocky Mountain Lodgepole Pine Forest</b>
11a. Conifer forests and woodlands typically dominated or codominated by <i>Abies lasiocarpa</i> and/or <i>Picea engelmannii</i> sometimes with <i>Pinus contorta</i> codominating. <i>Populus tremuloides</i> may be present, but is generally <25% of tree canopy.....	<b>12</b>
11b. Conifer forests dominated by other species .....	<b>13</b>
12a. Matrix subalpine conifer forests and woodlands of relatively dry subalpine environments that are widespread in the Rocky Mountain Region; <i>Abies lasiocarpa</i> and <i>Picea engelmannii</i> are the major canopy components, but other trees can include <i>Pseudotsuga menziesii</i> and <i>Pinus contorta</i> .....	<b>Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland</b>
12b. Large and small patch subalpine conifer forests and woodlands characteristic of relatively mesic local environments (such as north aspect toe slopes). Mesic understory species can include shrubs such as <i>Menziesia ferruginea</i> , <i>Vaccinium membranaceum</i> , <i>Rhododendron albiflorum</i> , <i>Amelanchier alnifolia</i> , <i>Rubus parviflorus</i> , <i>Ledum glandulosum</i> , <i>Phyllodoce empetriformis</i> ; forbs <i>Actaea rubra</i> , <i>Maianthemum stellatum</i> , <i>Cornus canadensis</i> , <i>Erigeron eximius</i> , <i>Gymnocarpium dryopteris</i> , <i>Rubus pedatus</i> , <i>Saxifraga bronchialis</i> , <i>Tiarella</i> spp., <i>Lupinus arcticus</i> ssp. <i>subalpinus</i> , <i>Valeriana sitchensis</i> , and graminoids <i>Luzula glabrata</i> var. <i>hitchcockii</i> or <i>Calamagrostis canadensis</i> .....	<b>Rocky Mountain Subalpine Mesic Spruce-Fir Forest and Woodland</b>
13a. Montane conifer forests and woodlands dominated or codominated by <i>Pseudotsuga menziesii</i> , <i>Abies</i> spp., <i>Pinus ponderosa</i> , <i>Pinus contorta</i> , <i>Pinus flexilis</i> and others.....	<b>14</b>
13b. Foothill [and lower montane] conifer forests and woodlands dominated by pinyon pine, <i>Juniperus</i> , <i>Quercus</i> , or <i>Larix</i> ) .....	<b>18</b>
14a. Conifer forests and woodlands strongly dominated by <i>Pinus contorta</i> (>2/3 total tree canopy).....	<b>Rocky Mountain Lodgepole Pine Forest</b>
14b. Conifer forests and woodlands NOT dominated <i>Pinus contorta</i> .....	<b>15</b>
15a. Conifer forests dominated by <i>Pinus ponderosa</i> . May have inclusions of <i>Pseudotsuga menziesii</i> woodlands on cool aspects. <i>Populus tremuloides</i> may be present, but is generally <25% of tree canopy. ....	<b>16</b>
15b. Conifer forests and woodlands dominated by <i>Abies concolor</i> , <i>Abies grandis</i> , <i>Picea pungens</i> , or <i>Pseudotsuga menziesii</i> , and sometime codominated by <i>Pinus ponderosa</i> and/or <i>P. contorta</i> . <i>Populus tremuloides</i> may be present, but is generally <25% of tree canopy .....	<b>17</b>

16a. Woodland to Savanna (open canopy) is (or could be) maintained by fire. <i>Pinus ponderosa</i> is the dominate canopy component. May have inclusions of <i>Pseudotsuga menziesii</i> woodlands on cool aspects. <i>Populus tremuloides</i> may be present, but is generally <25% of tree canopy. This is the predominant ponderosa pine system in Map Zones 8, 9 and 18 .....	<b>Northern Rocky Mountain Ponderosa Pine Woodland and Savanna</b>
16b Open structure of woodland and Savanna is substrate limited. Biomass is never abundant enough to carry fire. Wooded steppes occur at the lower tree line/ecotone between grasslands or shrublands and forests and woodlands typically on warm, dry, exposed sites too droughty to support a closed tree canopy. <i>Pinus ponderosa</i> (vars. <i>ponderosa</i> and <i>scopulorum</i> ) and <i>Pseudotsuga menziesii</i> are the predominant conifers (not always together); <i>Pinus flexilis</i> may be present or common .....	<b>Northern Rocky Mountain Foothill Conifer Wooded Steppe</b>
17a. Forests dominated by <i>Pseudotsuga menziesii</i> , <i>Abies</i> spp. and/or ponderosa pine, with or without other species .....	<b>18</b>
17b. Forests dominated by other conifers such as pinyon, juniper, Garry oak or larch. <i>Pseudotsuga menziesii</i> and <i>Pinus ponderosa</i> may be present, but clearly not the dominant canopy .....	<b>25</b>
18a. Mesic Mixed Forests dominated by <i>Abies grandis</i> , <i>Tsuga heterophylla</i> , <i>Thuja plicata</i> , and <i>Picea engelmannii</i> . <i>Pseudotsuga menziesii</i> commonly share the canopy, and <i>Pinus monticola</i> , <i>Pinus contorta</i> , <i>Abies grandis</i> , <i>Taxus brevifolia</i> , and <i>Larix occidentalis</i> are major associates. Mesic <i>Abies grandis</i> associations are included in this system, and <i>Abies grandis</i> is often the dominant in these situations; <i>Tsuga heterophylla</i> and <i>Thuja plicata</i> can both be absent. Key mesic understory species include <i>Asarum caudatum</i> , <i>Clintonia uniflora</i> , <i>Coptis occidentalis</i> , <i>Prosartes</i> , <i>Gymnocarpium dryopteris</i> , <i>Picea engelmannii</i> , <i>Taxus brevifolia</i> , <i>Tiarella trifoliata</i> , <i>Tiarella trifoliata</i> var. <i>unifoliata</i> , <i>Trientalis borealis</i> ssp. <i>latifolia</i> , <i>Trillium ovatum</i> , <i>Viola glabella</i> .....	<b>Northern Rocky Mountain Mesic Montane Mixed Conifer Forest</b>
18b. Forests not as above .....	<b>19</b>
19a. Dry Mixed Forests dominated by <i>Pseudotsuga menziesii</i> and <i>Pinus ponderosa</i> (but there can be one without the other) and other typically seral species, including <i>Pinus contorta</i> , <i>Pinus monticola</i> , <i>Larix occidentalis</i> , <i>Abies concolor</i> and <i>Abies grandis</i> typically present in Blue Mountains. Lacking the key mesic understory species listed above. This is the predominant montane forest in Map Zones 8, 9, and 18 .....	<b>Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest</b>
19b. Forests not as above .....	<b>20</b>
20a. Forests dominated by <i>Pseudotsuga menziesii</i> , occasionally with <i>Pinus flexilis</i> on calcareous substrates, and <i>Pinus contorta</i> at higher elevations. <i>Abies</i> species are absent, generally limited to eastern portion of Map Zone 18 (Southern and Southeastern Idaho) .....	<b>Middle Rocky Mountain Montane Douglas-fir Forest and Woodland</b>
20b. Forests not as above .....	<b>21</b>
21a. Matrix mixed-conifer forests and woodlands characteristic of relatively dry montane environments that are widespread in the Rocky Mountain Region, and come into southern Oregon and southeastern Idaho. Canopy dominants are <i>Abies concolor</i> , <i>Pseudotsuga menziesii</i> , <i>Pinus contorta</i> , <i>Pinus flexilis</i> . .....	<b>Southern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest and Woodland</b>
21b. Forests not as above .....	<b>22</b>
22a. Large and small patch mixed-conifer forests and woodlands typical of relatively mesic local environments (such as north aspect toe slopes) often with mesic species in the understory. <i>Abies concolor</i> and <i>Pseudotsuga menziesii</i> are the canopy dominants, Understory species include <i>Acer glabrum</i> , <i>Acer grandidentatum</i> , <i>Alnus incana</i> , <i>Betula occidentalis</i> , <i>Bromus ciliatus</i> , <i>Cornus sericea</i> , <i>Prosartes</i> , <i>Luzula</i> , <i>Osmorhiza</i> , <i>Physocarpus malvaceus</i> , <i>Picea engelmannii</i> , <i>Populus tremuloides</i> , <i>Robinia neomexicana</i> , <i>Salix</i> , <i>Sorbus scopulina</i> , <i>Thalictrum</i> , <i>Vaccinium membranaceum</i> , <i>Vaccinium myrtillus</i> .....	<b>Southern Rocky Mountain Mesic Montane Mixed Conifer Forest and Woodland</b>
22b. Forests not as above .....	<b>23</b>

23a. Forests dominated by a mix of <i>Quercus garryana</i> and <i>Pinus ponderosa</i> or <i>Pseudotsuga menziesii</i> .....	<b>East Cascades Oak-Ponderosa Pine Forest and Woodland</b>
23b. Forest without <i>Quercus garryana</i> present.....	<b>24</b>
24a. Conifer woodlands dominated or codominated by <i>Abies grandis</i> . Other trees species such as <i>Pseudotsuga menziesii</i> , <i>Picea pungens</i> , <i>Pinus ponderosa</i> and/or <i>Populus tremuloides</i> may be present. Significant <i>Abies grandis</i> understory is present if mature <i>Abies grandis</i> are not codominant in tree canopy .....	<b>Abies grandis Forest Alliance</b>
24b. Conifer woodlands dominated or codominated by <i>Pseudotsuga menziesii</i> . <i>Pinus ponderosa</i> may be present to codominant. <i>Populus tremuloides</i> may be present, but is generally <25% of tree canopy. <i>Abies concolor</i> is not present.....	<b>Pseudotsuga menziesii Forest Alliance****</b>
25a. Land Cover is dominated by Pinyon-Juniper woodlands, either together or individually. Stand dominated by <i>Pinus monophylla</i> , <i>Juniperus osteosperma</i> and/or <i>J. occidentalis</i> .....	<b>26</b>
25b. Land cover is NOT dominated by <i>Pinus monophylla</i> and/or <i>Juniperus</i> . Stands dominated by other species .....	<b>29</b>
26a. Woodlands dominated by <i>Juniperus occidentalis</i> .....	<b>27</b>
26b. Woodland dominated by <i>Juniperus osteosperma</i> and/or <i>Pinus monophylla</i> .....	<b>29</b>
27a. Woodlands are dominated by <i>Juniperus occidentalis</i> as the only tree species, <i>Pinus ponderosa</i> or <i>Pinus jeffreyi</i> may be present. <i>Cercocarpus ledifolius</i> may occasionally codominate .....	<b>Columbia Plateau Western Juniper Woodland and Savanna(28)</b>
27b. Woodlands dominated by other species .....	<b>29</b>
28a. Savanna with tree layer dominated by <i>Juniperus occidentalis</i> (10-25% cover) and over 20% cover of perennial graminoids. This is a fire maintained Alliance. Stands occur on the Modoc Plateau, in the Columbia Basin and Cascade mountains.....	<b>Juniperus occidentalis Wooded Herbaceous Alliance****</b>
28b. Woodlands dominated by <i>Juniperus occidentalis</i> (>15% tree cover). Perennial graminoid cover is typically low. If perennial graminoid cover >20% cover, then tree cover is over 25% cover. This is not fire maintained. Stands occur on the Modoc Plateau, in the Columbia Basin and Cascade mountains .....	<b>Juniperus occidentalis Woodland Alliance</b>
29a. Woodlands dominated a mix of <i>Pinus monophylla</i> and <i>Juniperus osteosperma</i> .....	<b>Great Basin Pinyon-Juniper Woodland</b>
29b. Lower elevation savanna dominated by <i>Juniperus osteosperma</i> with high cover of perennial bunch grasses and forbs, with <i>Bouteloua gracilis</i> , <i>Hesperostipa comata</i> , and <i>Pleuraphis jamesii</i> being most common. This system is generally found at lower elevations and more xeric sites than Great Basin Pinyon-Juniper Woodland .....	<b>Inter-Mountain Basins Juniper Savanna</b>
30a. Woodlands where <i>Quercus garryana</i> present, generally mixed with <i>Pinus ponderosa</i> or <i>Pseudotsuga menziesii</i> .....	<b>East Cascades Oak-Ponderosa Pine Forest and Woodland</b>
30b. Conifer dominated Forest or Woodlands, <i>Quercus garryana</i> not present.....	<b>31</b>
31a. Stands are open-canopied "savannas" of <i>Larix occidentalis</i> . Stands may be codominated by <i>Abies grandis</i> , <i>Abies lasiocarpa</i> , <i>Picea engelmannii</i> , or <i>Tsuga</i> spp. ....	<b>Northern Rocky Mountain Western Larch Savanna</b>
31b. Forest dominated by other species, or combination of tree species not included above .....	<b>undescribed or otherwise not included in this Key</b>

**KEY D: SHRUBLANDS, SHRUB-STEPPE, DWARF SHRUB-STEPPE, and  
DWARF-SHRUBLANDS**

1a. Dwarf-shrublands or dwarf shrub-steppe (generally less than 0.5 m in height) .....	<b>2</b>
1b. Tall shrubland or shrub-steppe (Generally greater than 0.5 m in height).....	<b>14</b>

## Dwarf-Shrublands (<0.5 M) And Dwarf-Steppe

- 2a. Alpine and subalpine dwarf-shrublands or herbaceous areas with some dwarf-shrubs, above or at upper tree line .....3
- 2b. Shrublands or shrub-steppe well below the alpine / upper subalpine altitudes.....4
- 3a. Alpine and subalpine dwarf-shrublands may be dominated by *Dryas octopetala*, *Ledum glandulosum*, *Kalmia microphylla*, *Salix arctica*, *S. nivalis*, *S. petrophila*, *Salix reticulata*, and/or *Vaccinium* spp. ....**Rocky Mountain Alpine Dwarf-Shrubland**
- 3b. Alpine and subalpine herbaceous tundra with some dwarf-shrubs such as *Dryas octopetala*, *Arctostaphylos uva-ursi*, but the area is dominated by herbaceous vegetation. Can be in a mosaic with the above. Dominant plants include: *Artemisia arctica*, *Carex elynoides*, *Carex siccata*, *Carex scirpoidea*, *Carex nardina*, *Carex rupestris*, *Festuca brachyphylla*, *Festuca idahoensis*, *Geum rossii*, *Kobresia myosuroides*, *Phlox pulvinata*, and *Trifolium dasyphyllum*..... **Rocky Mountain Dry Tundra**
- 4a. Low shrubland or shrub-steppe dominated or codominated by *Artemisia* spp.....5
- 4b. Tall shrublands (>0.5 m) dominated by *Artemisia* or other species.....15
- 5a. Open dwarf-shrub canopy dominated by *Artemisia rigida* ..... **Columbia Plateau Scabland Shrubland**
- 5b. Dwarf-shrubland dominated by other species .....6
- 6a. *Artemisia tridentata* ssp. *vaseyana* is the dominant sagebrush, other species may be present, stands in the mountains, generally above 2000 m (6560 ft) .....7
- 6c. Stands NOT dominated or codominated by *Artemisia tridentata* ssp. *vaseyana*.....8
- 7a. Montane or subalpine (>2000 m elevations) shrubland or shrub-steppe (herbaceous cover >25%) dominated or codominated by *Artemisia tridentata* ssp. *vaseyana*, *A. tridentata* ssp. *spiciformis*, non-riparian *A. cana* ssp. *viscidula* and/or *A. arbuscula* ssp. *arbuscula*. *Symphoricarpos* spp. may codominate some stands. These are mixed-montane shrublands, with many shrubs commonly present in varying abundance.....**Inter-Mountain Basins Montane Sagebrush Steppe**
- 7b. *Artemisia tridentata* ssp. *vaseyana* typically dominates shrub layer with 10% or more absolute cover and with typically less than 20% total perennial herbaceous cover. ....**Artemisia tridentata ssp. *vaseyana*** **Shrubland Alliance**
- 8a. Stands dominated by *Artemisia arbuscula*, *Artemisia nova*, *Purshia tridentata*, *Artemisia arbuscula* ssp. *longiloba*, *Artemisia tridentata* ssp. *wyomingensis*, singly or mixed .....9
- 8a. Dwarf-shrublands dominated by other species.....12
- 9a. Stand occurs in the Columbia Plateau area (all of Map Zone 8, most of 9 & 18) .....10
- 9b. Stands occur in the Great Basin area (limited to the southern most portions of Map Zones 9 and 18).....11
- 10a. Stands dominated by *Artemisia arbuscula*, *Artemisia nova* alone or together and often with some *Purshia tridentata* (less than 5% relative cover). *Artemisia arbuscula* ssp. *longiloba* may be present as well. Stands typically occur on mountain ridges and flanks and broad terraces, ranging from 1000 to 3000 m in elevation.....**Columbia Plateau Low Sagebrush Steppe**
- 10b. Large, mappable stands dominated by *Artemisia arbuscula* with no other shrubs .....**Artemisia arbuscula** ssp. *arbuscula* **Dwarf-Shrubland Alliance**
- 11a. Stands in the Great Basin, on dry flats and plains, alluvial fans, rolling hills, rocky hillslopes, saddles and ridges at elevations between 1000 and 2600 m. Shrublands are dominated by *Artemisia nova* (mid and low elevations), *Artemisia arbuscula* (higher elevation) and may be codominated by *Artemisia tridentata* ssp. *wyomingensis* or *Chrysothamnus viscidiflorus*.....**Great Basin Xeric Mixed Sagebrush Shrubland**
- 11b. Large, mappable stands dominated by *Artemisia arbuscula* with no other shrubs .....**Artemisia arbuscula** ssp. *arbuscula* **Dwarf-Shrubland Alliance**

- 12a. Low shrubland or shrub-steppe dominated or codominated *Krascheninnikovia lanata*, *Chrysothamnus viscidiflorus*, *Chrysothamnus Greenei*, *Gutierrezia sarothrae*, *Ephedra* spp., *Ericameria nauseosa* and/or *Ericameria parryi*. This widespread type occurs throughout the intermountain western U.S. typically at lower elevations on alluvial fans and flats with moderate to deep soils. This semi-arid shrub-steppe is typically dominated by graminoids (>25% cover) with an open shrub layer ..... **Inter-Mountain Basins Semi-Desert Shrub-Steppe**
- 12b. Low shrubland or shrub-steppe dominated or codominated by *Atriplex* spp. .... **13**
- 13a. Low shrubland or shrub-steppe dominated or codominated by low *Atriplex confertifolia* or *Atriplex canescens*. Open-canopied shrublands of typically saline basins, alluvial slopes and plains composed of one or more *Atriplex* species such as *Atriplex confertifolia*, *Atriplex canescens*, *Atriplex polycarpa*, or *Atriplex spinifera* ..... **Inter-Mountain Basins Mixed Salt Desert Scrub**
- 13b. Other dwarf-shrub taxa dominate the shrub layer ..... **Undescribed or otherwise not included in this Key**

**Shrublands (>0.5 M) And Shrub-Steppe**

- 14a. Shrublands or shrub-steppe dominated by tall (generally >0.5 m in height) *Artemisia* species ..... **15**
- 14b. Tall Shrublands dominated by species other than *Artemisia* species (which may be present but not the dominant shrub) ..... **18**
- 15a. Shrubland or shrub-steppe where shrub cover is at least 10-40% and herbaceous cover is at least 25% cover, herbaceous cover is high, but imbedded in shrubby area, small patches of herbaceous cover with shrubs may occur ..... **16**
- 15b. Herbaceous cover far out weighs shrub cover, shrub cover is 10-20%, and herbaceous cover is 25%+. The area looks like a grassland with a few, scattered shrubs, the inverse of above ..... **17**
- 16a. *Artemisia tridentata* ssp. *tridentata* and/or *Artemisia tridentata* ssp. *wyomingensis* dominate relative cover of shrub layer with 10% or more absolute cover and with less than 25% total perennial herbaceous cover; typically in broad basins between mountain ranges, plains and foothills between 1500 and 2300 m elevation. Soils are typically deep, well-drained and non-saline ..... **Inter-Mountain Basins Big Sagebrush Shrubland**
- 16b. *Artemisia tridentata* ssp. *tridentata*, *Artemisia tridentata* ssp. *xericensis*, *Artemisia tridentata* ssp. *wyomingensis*, *Artemisia tripartita* ssp. *tripartita*, and/or *Purshia tridentata* dominate open to moderately dense (10-40% cover) shrub layer and with at least 25% total perennial herbaceous cover. The natural fire regime of this ecological system likely maintains a patchy distribution of shrubs, so the general aspect of the vegetation is a grassland ..... **Inter-Mountain Basins Big Sagebrush Steppe**
- 17a. Grassland is dominated by perennial bunch grasses and forbs (>25% cover) sometimes with a sparse (<10% cover) shrub layer; *Chrysothamnus viscidiflorus*, *Ericameria nauseosa*, *Tetradymia* spp., or *Artemisia* spp. may be present in disturbed stands. Associated graminoids include *Achnatherum hymenoides*, *Achnatherum thurberianum*, *Elymus elymoides*, *Elymus lanceolatus* ssp. *lanceolatus*, *Hesperostipa comata*, *Festuca idahoensis*, *Koeleria macrantha*, *Poa secunda*, and *Pseudoroegneria spicata* ..... **Columbia Plateau Steppe and Grassland**
- 17b. Grasslands with few scattered shrubs, not as above ..... **GO TO Key E**
- 18a. Shrublands of montane foothill to subalpine elevations. .... **19**
- 18b. Shrublands of desert, semi-desert, or saline environments ..... **22**
- 19a. Shrublands of subalpine environments in the Blue Mountains. Shrublands within the zone of continuous forest in the upper montane and lower subalpine zones. Dominated by *Menziesia ferruginea*, *Rhamnus alnifolia*, *Ribes lacustre*, *Rubus parviflorus*, *Alnus viridis*, *Rhododendron albiflorum*, *Sorbus scopulina*, *Sorbus sitchensis*, *Vaccinium myrtillus*, *Vaccinium scoparium*, and *Vaccinium membranaceum* occurring alone or in any combination. Other shrubs can include *Shepherdia canadensis* and *Ceanothus velutinus*, but these also commonly occur in Northern Rocky Mountain Montane-Foothill Deciduous Shrubland ..... **Northern Rocky Mountain Subalpine Deciduous Shrubland**
- 19b. Shrublands of foothills, canyon slopes and lower mountains ..... **20**



20a. Shrublands on lower montane, foothill, canyon slopes of Rocky Mountains and Blue Mountains .....	21
20b. Shrublands in low-elevation desert and Pinyon-Juniper landscapes in the Great Basin .....	22
21a. Shrub layer is dominated or codominated by <i>Amelanchier utahensis</i> , <i>Cercocarpus montanus</i> , <i>Purshia tridentata</i> , <i>Rhus trilobata</i> , <i>Ribes cereum</i> , <i>Symphoricarpos oreophilus</i> , <i>S. rotundifolia</i> , and/or <i>Yucca glauca</i> . <i>Artemisia tridentata</i> may be present, but not codominant .....	
.....	<b>Rocky Mountain Lower Montane-Foothill Shrubland</b>
21b. Shrublands of lower montane and foothill elevations dominated by <i>Physocarpus malvaceus</i> , <i>Spiraea douglasii</i> , <i>Amelanchier alnifolia</i> , <i>Prunus emarginata</i> , <i>Prunus virginiana</i> , <i>Holodiscus discolor</i> ; in more mesic areas, <i>Symphoricarpos albus</i> , <i>Menziesia ferruginea</i> , <i>Crataegus douglasii</i> , or <i>Rosa</i> spp. can be predominant; typically occurring around the fringes of the Columbia Basin and in northern Rockies .....	
.....	<b>Northern Rocky Mountain Lower Montane Mesic Deciduous Shrubland</b>
22a. Low-elevation desert landscapes up into pinyon-juniper woodlands of the western and central Great Basin. Typically open-canopy shrublands with open spaces either bare or supporting patchy grasses and forbs. Characteristic species may include <i>Arctostaphylos patula</i> , <i>Arctostaphylos pungens</i> , <i>Ceanothus greggii</i> , <i>Ceanothus velutinus</i> , <i>Cercocarpus montanus</i> var. <i>glaber</i> , <i>Cercocarpus intricatus</i> , <i>Eriogonum fasciculatum</i> , <i>Garrya flavescens</i> , <i>Quercus turbinella</i> , <i>Purshia stansburiana</i> , and <i>Rhus trilobata</i> . <i>Cercocarpus ledifolius</i> is generally absent .....	
.....	<b>Great Basin Semi-Desert Chaparral</b>
22b. Low-elevation desert shrublands not as above .....	23
23a. Shrubs such as <i>Atriplex</i> spp. and/or <i>Krascheninnikovia lanata</i> dominate the moderate to dense shrub layer. Herbaceous vegetation cover is often relatively low and may include <i>Distichlis spicata</i> , <i>Sporobolus airoides</i> , or other alkali/saline tolerant grasses. Stands are typically found in basins, but may extend into plains, piedmont and foothills, depending on soils conditions .....	
.....	<b>Inter-Mountain Basins Mixed Salt Desert Scrub</b>
23b. Shrublands dominated by <i>Chrysothamnus</i> spp., <i>Ericameria</i> spp., <i>Ephedra</i> spp., <i>Gutierrezia sarothrae</i> , <i>Krascheninnikovia lanata</i> and/or other shrubs and dwarf-shrubs are present forming an open shrub layer with a typically strong perennial grass understory. <i>Artemisia tridentata</i> generally absent or low cover. Stands are typically found in plains, piedmont and foothills .....	
.....	<b>Inter-Mountain Basins Semi-Desert Shrub-Steppe</b>

## KEY E: HERBACEOUS ECOLOGICAL SYSTEMS AND ALLIANCES

(Perennial graminoids dominant >20% cover with low woody cover <10%)

1a. Land cover is restricted to drainages, semi-riparian flats, springs or seeps .....	2
1b. Land cover is upland vegetation .....	9
<b>Wetland Herbaceous</b>	
2a. Middle and lower elevation herbaceous wetlands (lower montane to valley floor) .....	3
2b. Middle to upper elevation herbaceous wetlands (montane elevations, montane valleys) .....	7
3a. Wetland dominated by emergent graminoids or floating aquatic species in open water (Emergent graminoid spp.: <i>Carex</i> , <i>Scirpus</i> and/or <i>Schoenoplectus</i> , <i>Eleocharis</i> , <i>Juncus</i> , <i>Typha latifolia</i> . Floating aquatic spp.: <i>Azolla</i> spp., <i>Nuphar lutea</i> , <i>Polygonum</i> spp., <i>Potamogeton</i> spp., <i>Ranunculus</i> spp., and <i>Wolffia</i> spp.). May be any of the following systems, generally small patch types, too small for Landfire Mapping purposes, although some occurrences can be quite large .....	
.....	<b>North American Arid West Emergent Marsh***</b>
.....	<b>Temperate Pacific Freshwater Emergent Marsh***</b>
.....	<b>Temperate Pacific Freshwater Aquatic Bed***</b>
.....	<b>Inter-Mountain Basins Interdunal Swale Wetland***</b>
.....	<b>Northern Columbia Plateau Basalt Pothole Ponds ***</b>
3b. Wetland dominated by herbaceous vegetation not like the above (vernal pools key here) .....	4

4a. Alkaline flats and depressions, often dominated by <i>Distichlis spicata</i> , <i>Puccinellia lemmonii</i> , <i>Poa secunda</i> , <i>Muhlenbergia</i> spp., <i>Leymus triticoides</i> (= <i>Elymus triticoides</i> ), <i>Schoenoplectus maritimus</i> , <i>Schoenoplectus americanus</i> , <i>Triglochin maritima</i> , and <i>Salicornia</i> spp. ...	<b>Inter-Mountain Basins Alkaline Closed Depression***</b>	
4b. Not as above.....		5
5a. Freshwater sparsely vegetated mud to extensive sods of herbaceous vegetation, occur primarily in seasonally flooded shallow lakebeds on floodplains, especially along the lower Columbia River. Species include <i>Eleocharis obtusa</i> , <i>Lilaeopsis occidentalis</i> , <i>Crassula aquatica</i> , <i>Limosella aquatica</i> , <i>Gnaphalium palustre</i> , <i>Eragrostis hypnoides</i> , and <i>Ludwigia palustris</i> . ....	<b>Temperate Pacific Freshwater Mudflat***</b>	
5b. Small to large ephemeral wetlands, wet for only part of the year, drying out completely .....		6
6a. Small to large (3 sq m to 1600 sq m) perched vernal pools, found throughout the exposed volcanic scablands of the Columbia Plateau in Washington, Oregon, and northern Nevada. Characteristic species include <i>Callitriche marginata</i> , <i>Camissonia tanacetifolia</i> , <i>Elatine</i> spp., <i>Epilobium densiflorum</i> , <i>Eryngium vaseyi</i> , <i>Juncus uncialis</i> , <i>Myosurus minimus</i> , <i>Plagiobothrys</i> spp., <i>Polygonum polygaloides</i> ssp. <i>confertiflorum</i> , <i>Polygonum polygaloides</i> ssp. <i>polygaloides</i> , <i>Psilocarphus brevissimus</i> , <i>Psilocarphus elatior</i> , <i>Psilocarphus oregonus</i> , and <i>Trifolium cyathiferum</i> . <i>Artemisia ludoviciana</i> ssp. <i>ludoviciana</i> .....	<b>Columbia Plateau Vernal Pool***</b>	
6b. Small (no larger than 50 sq meters) vernal pools, in the Lassen and Klamath regions, and along the eastern flanks of the Columbia River Gorge, located on top of massive basalt flows where soils are very thin over solid bedrock. Characteristic species include <i>Blennosperma nanum</i> , <i>Epilobium densiflorum</i> (= <i>Boisduvalia densiflora</i> ), <i>Callitriche marginata</i> , <i>Cicendia quadrangularis</i> , <i>Eryngium vaseyi</i> , <i>Psilocarphus brevissimus</i> , and <i>Sedella pumila</i> (= <i>Parvisedum pumilum</i> ). <i>Artemisia cana</i> ssp. <i>bolanderi</i> can occur on better developed soils.....	<b>Modoc Basalt Flow Vernal Pool***</b>	
7a. Herbaceous riparian and wetland at middle and high montane settings, dominated by <i>Carex aquatilis</i> , <i>Carex athrostachya</i> , <i>Carex limosa</i> , <i>Carex microptera</i> , <i>Carex nebrascensis</i> , <i>Carex pellita</i> , <i>Carex praegracilis</i> , <i>Carex scopulorum</i> , <i>Carex utriculata</i> , <i>Carex vesicaria</i> , <i>Distichlis spicata</i> , <i>Hordeum jubatum</i> , <i>Leymus triticoides</i> , or <i>Senecio triangularis</i> .....	<b>Temperate Pacific Subalpine-Montane Wet Meadow***</b>	
7b. Not as above.....		8
8a. Subalpine wetlands defined by groundwater inflows, mineral-rich alkaline soil and water, and peat accumulation of at least 40 cm. ....	<b>Rocky Mountain Subalpine - Montane Fen***</b>	
8b. Montane to alpine to wet meadows without a 40 cm deep organic layer .....	<b>Rocky Mountain Alpine - Montane Wet Meadow***</b>	
<b>Upland Herbaceous</b>		
9a. Upland herbaceous cover dominated by annual graminoids or annual and biennial forbs.....		10
9b. Upland herbaceous cover dominated by perennial species .....		11
10a. Herbaceous cover dominated by introduced annual species of brome grass (typically <i>Bromus tectorum</i> , but including <i>Bromus japonicus</i> , <i>Bromus rubens</i> , <i>Bromus hordeaceus</i> , <i>Bromus rigidus</i> ....	<b>Invasive Annual Grassland</b>	
10b. Herbaceous cover dominated by introduced annual and biennial forbs (including <i>Ceratocephala testiculata</i> , <i>Halogeton glomeratus</i> , <i>Bassia scoparia</i> , <i>Lepidium perfoliatum</i> , <i>Salsola kali</i> , etc.) .....	<b>Invasive Annual and Biennial Forbland</b>	
11a. Herbaceous cover dominated by introduced perennial grasses and forbs (including <i>Agropyron cristatum</i> , <i>Alopecurus geniculatus</i> , <i>Agrostis stolonifera</i> , <i>Bromus inermis</i> , <i>Centaurea</i> sp., <i>Cirsium arvense</i> , <i>Euphorbia esula</i> , <i>Lepidium latifolium</i> , <i>Melilotus</i> spp., <i>Thinopyrum intermedium</i> , <i>Poa pratensis</i> , <i>Phleum pratense</i> , and other introduced forage species .....	<b>Invasive Perennial Grassland and Forbland</b>	
11b. Herbaceous cover dominated by native species .....		12
12a Alpine and upper subalpine herbaceous vegetation.....		13
12b Lower subalpine, montane, foothill and basin vegetation .....		16

13a. Alpine herbaceous vegetation .....	14
13b. Subalpine herbaceous vegetation .....	15
14a. Alpine herbaceous vegetation dominated or codominated by graminoids with low cover of rock. Found between 3200 and 4500 m in elevation on gentle to moderate slopes, flat ridges, valleys, and basins. Dominant species include <i>Artemisia arctica</i> , <i>Carex</i> spp., <i>Deschampsia caespitosa</i> , <i>Festuca brachyphylla</i> , <i>Geum rossii</i> , <i>Kobresia myosuroides</i> , and <i>Trifolium dasyphyllum</i> . Cover of cushion plants is generally low .....	<b>Rocky Mountain Dry Tundra</b>
14b. Alpine cover has significant amounts of vascular herbaceous vegetation (typically cushion plants) generally with greater than 50% cover exposed rock. Occurs on wind-exposed sites. ....	<b>Rocky Mountain Alpine Fell-Field</b>
15a. Subalpine herbaceous vegetation found above 3000 m in elevation typically in mesic alpine basins and more wind-protected areas, but includes all subalpine grasslands. Forbs typically contributing more to overall cover than graminoids. Important species include <i>Erigeron</i> spp., Asteraceae spp., <i>Mertensia</i> spp., <i>Penstemon</i> spp., <i>Campanula</i> spp., <i>Lupinus</i> spp., <i>Solidago</i> spp., <i>Ligusticum</i> spp., <i>Balsamorhiza sagittata</i> , <i>Wyethia</i> spp., <i>Deschampsia caespitosa</i> , <i>Koeleria macrantha</i> , <i>Dasiphora fruticosa ssp. floribunda</i> , <i>Rosa woodsii</i> , and <i>Symphoricarpos</i> spp. ....	<b>Rocky Mountain Subalpine Mesic Meadow</b>
15b. Herbaceous riparian and wetland at middle and high montane settings, dominated by <i>Carex aquatilis</i> , <i>Carex athrostachya</i> , <i>Carex limosa</i> , <i>Carex microptera</i> , <i>Carex nebrascensis</i> , <i>Carex pellita</i> , <i>Carex praeegracilis</i> , <i>Carex scopulorum</i> , <i>Carex utriculata</i> , <i>Carex vesicaria</i> , <i>Distichlis spicata</i> , <i>Hordeum jubatum</i> , <i>Leymus triticoides</i> , or <i>Senecio triangularis</i> .....	<b>Temperate Pacific Subalpine-Montane Wet Meadow***</b>
16a. Subalpine and Montane herbaceous vegetation.....	17
16b. Foothill and Basins herbaceous vegetation .....	18
17a. Subalpine grasslands in small meadows to large open parks surrounded by conifer trees; dominated by <i>Leymus innovatus</i> , <i>Koeleria macrantha</i> , <i>Festuca campestris</i> , <i>Festuca idahoensis</i> , <i>Festuca viridula</i> , <i>Achnatherum occidentale</i> , <i>Achnatherum richardsonii</i> , <i>Bromus inermis ssp. pumpellianus</i> , <i>Elymus trachycaulus</i> , <i>Trisetum spicatum</i> , <i>Fragaria virginiana</i> , and <i>Chamerion angustifolium</i> .....	<b>Northern Rocky Mountain Subalpine - Upper Montane Grassland</b>
17b. Montane grasslands found small meadows to large open parks surrounded by conifer trees, generally at lower elevations than the subalpine grasslands; Vegetation is dominated by cool-season, medium-tall bunch grasses dominated by <i>Festuca campestris</i> , <i>Pseudoroegneria spicata</i> , <i>Festuca idahoensis</i> , <i>Leymus cinereus</i> , <i>Elymus trachycaulus</i> , <i>Bromus inermis ssp. pumpellianus</i> , <i>Achnatherum richardsonii</i> , <i>Achnatherum occidentale</i> , <i>Koeleria macrantha</i> , and other graminoids such as <i>Carex filifolia</i> and <i>Danthonia intermedia</i> ..	<b>Northern Rocky Mountain Montane Grassland</b>
18a. Foothill grasslands, surrounded by forests .....	19
18b. Valley floor grasslands, surrounded by vegetation lower than lower tree line.....	20
19a. Foothill herbaceous vegetation found on steep open slopes, from 90 to 1525 m elevation in the canyons and valleys of the Columbia Basin, particularly along the Snake River canyon, the lower foothill slopes of the Blue Mountains, and along the main stem of the Columbia River. Settings are primarily long, steep slopes of 100 m to well over 400 m, and slope failure is a common process. Vegetation is dominated by patchy graminoid cover, cacti, and some forbs. <i>Pseudoroegneria spicata</i> , <i>Festuca idahoensis</i> , and <i>Opuntia polyacantha</i> are common species. Deciduous shrubs <i>Symphoricarpos</i> spp., <i>Physocarpus malvaceus</i> , <i>Holodiscus discolor</i> , and <i>Ribes</i> spp. are infrequent native species that may increase with fire exclusion. ....	<b>Columbia Basin Foothill and Canyon Dry Grassland</b>
19b. Grasslands found at elevations from 300 to 1650 m, ranging from small meadows to large open parks surrounded by conifers in the lower montane, to extensive foothill and valley grasslands below the lower tree line. <i>Pseudoroegneria spicata</i> , <i>Festuca campestris</i> , <i>Festuca idahoensis</i> , or <i>Hesperostipa comata</i> commonly dominate sites on all aspects of level to moderate slopes and on certain steep slopes with a variety of other grasses, such as <i>Achnatherum hymenoides</i> , <i>Achnatherum richardsonii</i> , <i>Hesperostipa curtisetata</i> , <i>Koeleria macrantha</i> , <i>Leymus cinereus</i> , <i>Elymus trachycaulus</i> , <i>Bromus inermis ssp. pumpellianus</i>	

(= *Bromus pumpellianus*), *Achnatherum occidentale* (= *Stipa occidentalis*), *Pascopyrum smithii*, and other graminoids such as *Carex filifolia* and *Danthonia intermedia* .....  
 ..... **Northern Rocky Mountain Lower Montane, Foothill and Valley Grassland**

20a. This once-extensive grassland system occurs in eastern Washington and Oregon, and west-central Idaho, though in very small patches there. Characteristic species are *Pseudoroegneria spicata* and *Festuca idahoensis* with *Hesperostipa comata*, *Achnatherum scribneri*, *Leymus condensatus*, *Leymus cinereus*, *Koeleria macrantha*, *Pascopyrum smithii*, or *Poa secunda*. Remnant grasslands are now typically associated with steep and rocky sites or small and isolated sites within an agricultural landscape.  
 ..... **Columbia Basin Palouse Prairie**

20b. Grasslands on dry plains and mesas, at approximately 1450 to 2320 m (4750-7610 feet) elevation. Dominated by *Achnatherum hymenoides*, *Aristida* spp., *Bouteloua gracilis*, *Hesperostipa comata*, *Muhlenbergia* spp., or *Pleuraphis jamesii*. May include scattered shrubs and dwarf-shrubs of species of *Artemisia*, *Atriplex*, *Coleogyne*, *Ephedra*, *Gutierrezia*, or *Krascheninnikovia* .....  
 ..... **Inter-Mountain Basins Semi-Desert Grassland**