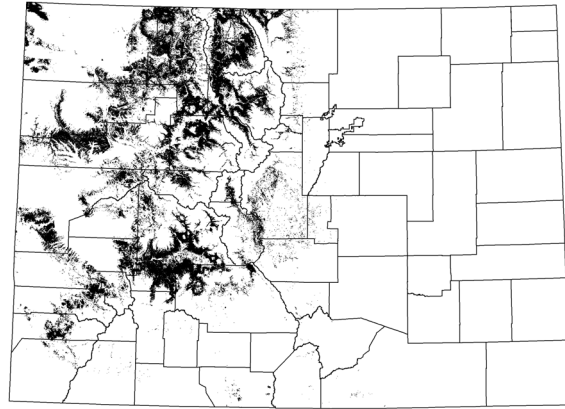


INTER-MOUNTAIN BASINS MONTANE SAGEBRUSH STEPPE



R. Rondeau



extent exaggerated for display

- ARTEMISIA ARBUSCULA SSP. ARBUSCULA SHRUB HERBACEOUS ALLIANCE
Artemisia arbuscula ssp. *arbuscula* / *Festuca idahoensis* Shrub Herbaceous Vegetation
- ARTEMISIA CANA (SSP. BOLANDERI, SSP. VISCIDULA) SHRUB HERBACEOUS ALLIANCE
Artemisia cana ssp. *viscidula* / *Festuca idahoensis* Shrub Herbaceous Vegetation
- ARTEMISIA CANA (SSP. BOLANDERI, SSP. VISCIDULA) SHRUBLAND ALLIANCE
Artemisia cana ssp. *viscidula* / *Festuca thurberi* Shrubland
Artemisia cana ssp. *viscidula* / *Purshia tridentata* Shrubland
- ARTEMISIA TRIDENTATA SSP. VASEYANA SHRUB HERBACEOUS ALLIANCE
Artemisia tridentata ssp. *vaseyana* / *Carex geyeri* Shrub Herbaceous Vegetation
Artemisia tridentata ssp. *vaseyana* / *Festuca idahoensis* Shrub Herbaceous Vegetation
- ARTEMISIA TRIDENTATA SSP. VASEYANA SHRUBLAND ALLIANCE
Artemisia tridentata ssp. *vaseyana* - *Symphoricarpos oreophilus* / *Elymus trachycaulus* ssp. *trachycaulus* Shrubland
Artemisia tridentata ssp. *vaseyana* - *Balsamorhiza sagittata* Shrubland
Artemisia tridentata ssp. *vaseyana* / *Festuca idahoensis* - *Bromus carinatus* Shrubland
Artemisia tridentata ssp. *vaseyana* / *Hesperostipa comata* Shrubland
Artemisia tridentata ssp. *vaseyana* / *Leucopoa kingii* Shrubland
Artemisia tridentata ssp. *vaseyana* / *Leymus cinereus* Shrubland
Artemisia tridentata ssp. *vaseyana* / *Pascopyrum smithii* Shrubland
Artemisia tridentata ssp. *vaseyana* / *Pseudoroegneria spicata* Shrubland

Overview: This matrix forming ecological system includes sagebrush communities occurring at montane and subalpine elevations across the western U.S. Colorado occurrences are found primarily on the west slope, often in proximity to big sagebrush shrublands. These shrublands are dominated by *Artemisia tridentata* ssp. *vaseyana* and related taxa such as *Artemisia tridentata* ssp. *spiciformis* (= *Artemisia spiciformis*), non-riparian *Artemisia cana* ssp. *viscidula*, and *Artemisia arbuscula* ssp. *arbuscula*.

Characteristic species: Vegetation types within this ecological system are usually less than 1.5 m tall and dominated by *Artemisia tridentata* ssp. *vaseyana*, *Artemisia cana* ssp. *viscidula*, or *Artemisia tridentata* ssp. *spiciformis*. A variety of other shrubs including *Artemisia frigida*, *Artemisia arbuscula*, *Ericameria nauseosa*, *Chrysothamnus viscidiflorus*, *Symphoricarpos oreophilus*, *Purshia tridentata*, *Peraphyllum ramosissimum*, *Ribes cereum*, *Rosa woodsii*, *Ceanothus velutinus*, and *Amelanchier alnifolia* can be found in some occurrences, but these are seldom dominant. The canopy cover is usually between 20-80%. The herbaceous layer is usually well represented, but bare ground may be common in particularly arid or disturbed occurrences. Graminoids that can be abundant include *Festuca idahoensis*, *Festuca thurberi*, *Festuca ovina*, *Elymus elymoides*, *Deschampsia caespitosa*, *Danthonia intermedia*, *Danthonia parryi*, *Stipa* spp., *Pascopyrum smithii*, *Bromus carinatus*, *Elymus trachycaulus*, *Koeleria macrantha*, *Pseudoroegneria spicata*, *Poa fendleriana*, *Poa secunda*, and *Carex* spp. Forbs are often numerous and an important

indicator of health. Forb species may include *Castilleja*, *Potentilla*, *Erigeron*, *Phlox*, *Astragalus*, *Geum*, *Lupinus*, and *Eriogonum* species, *Balsamorhiza sagittata*, *Achillea millefolium*, *Antennaria rosea*, *Fragaria virginiana*, *Artemisia ludoviciana*, and *Hymenoxys hoopesii* (= *Helenium hoopesii*).

Environment: The climate regime is cool, semi-arid to subhumid, with yearly precipitation ranging from 8 to 35 in/year (25-90 cm/year). Much of this precipitation falls as snow. Temperatures are continental with large annual and diurnal variation. In general this system shows an affinity for mild topography, fine soils, and some source of subsurface moisture. Soils generally are moderately deep to deep, well-drained, and of loam, sandy loam, clay loam, or gravelly loam textural classes; soils often have a substantial volume of coarse fragments, and are derived from a variety of parent materials. This system primarily occurs on deep-soiled to stony flats, ridges, nearly flat ridgetops, and mountain slopes. All aspects are represented, but the higher elevation occurrences may be restricted to south- or west-facing slopes.



G. Doyle

Dynamics: Healthy sagebrush shrublands are very productive, are often grazed by domestic livestock. Prolonged livestock use can cause a decrease in the abundance of native bunch grasses and increase in the cover of shrubs and non-native grass species, such as *Poa pratensis*.

Artemisia cana resprouts vigorously following spring fire, and prescribed burning may increase shrub cover. Conversely, fire in the fall may decrease shrub abundance. *Artemisia tridentata* is generally killed by fires and may take over ten years to form occurrences of some 20% cover or more. The condition of most sagebrush steppe has been degraded due to fire suppression and heavy livestock grazing. It is unclear how long it will take to restore degraded occurrences.

Rank:	A	B	C	D
① SIZE				
Acres	>90,000	50,000-90,000	30,000-50,000	< 30,000
② CONDITION				
Community structure	If trees are present, these are widely scattered and mature. Species richness is often high, and native bunch grasses or sedges (non-increasers) are dominant.	If trees are present, these are widely scattered and mature. Species richness is often high, and native grasses (non-increasers) are dominant.	Alteration of vegetation is extensive but potentially restorable over several decades.	Alteration of vegetation is extensive and restoration potential is low. System remains fundamentally compromised despite restoration of some processes.
Invasive exotics with major potential to alter structure and composition (e.g., non-native thistle, <i>Bromus inermis</i> , <i>Poa pratensis</i> , <i>Bromus tectorum</i>)	Absent or < 1% cover.	May be present, but <3% cover.	Likely to be present.	Present.
Other non-native spp.	<1% cover, native species dominant.	<5% cover, native species dominant.	Co-dominant with native species.	Dominant.
Native increaser spp. (e.g. <i>Balsamorhiza</i> , <i>Wyethia</i> , <i>Gutierrezia sarothrae</i>)	< 3% cover.	<5% cover.	>10% cover.	May be dominant.
Disturbance	Few to no roads.	Few roads.	Vehicle use or livestock grazing disturbance, if present, is extensive and significant.	Vehicle use or livestock grazing disturbance, if present, is extensive and significant.
Ground cover	Soil erosion is not accelerated by anthropogenic activities.	Accelerated soil erosion may be present in isolated patches.	Disturbance has had notable impact on species composition, soil compaction, and soil erosion.	Soil compaction and continued disturbance is extensive throughout the occurrence.
③ LANDSCAPE CONTEXT				
Connectivity	Connectivity of adjacent systems allows natural ecological processes, e.g., fire, and species migrations to occur. No unnatural barriers present.	Adjacent systems surrounding occurrence retain much connectivity. Few non-natural barriers present.	Adjacent systems surrounding occurrence are fragmented by alteration with limited connectivity.	Connectivity is severely hampered.
Surrounding land	At least 90% native and unaltered landscape with very little to no urban development or agriculture, and little to no industrial forestry.	Surrounding landscape composed of at least 75% natural or semi-natural vegetation, with little urban development within or adjacent to the occurrence.	Surrounding landscape is a mosaic of agricultural or semi-developed areas with >50% natural or semi-natural vegetation. Some non-natural barriers are present. Significant disturbance, but easily restorable.	Major human-caused alteration of surrounding landscape. Adjacent systems surrounding occurrence are mostly converted to agricultural or urban uses.