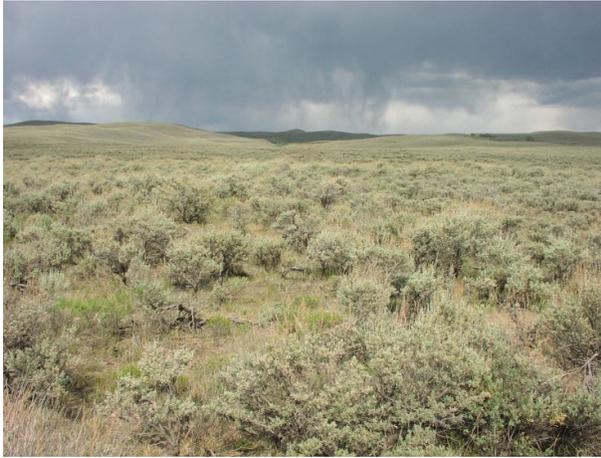
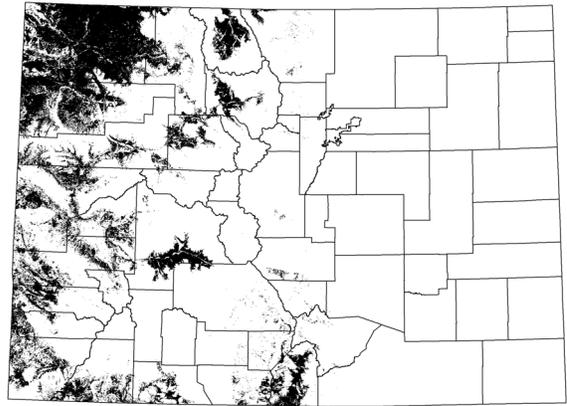


INTER-MOUNTAIN BASINS BIG SAGEBRUSH SHRUBLAND



R. Rondeau



extent exaggerated for display

- ARTEMISIA TRIDENTATA (SSP. TRIDENTATA, SSP. XERICENSIS) SHRUB HERBACEOUS ALLIANCE
 - Artemisia tridentata* (ssp. *tridentata*, ssp. *xericensis*) / *Pseudoroegneria spicata* Shrub Herbaceous Vegetation
- ARTEMISIA TRIDENTATA (SSP. TRIDENTATA, SSP. XERICENSIS) SHRUBLAND ALLIANCE
 - Artemisia tridentata* ssp. *tridentata* / *Leymus cinereus* Shrubland
 - Artemisia tridentata* ssp. *tridentata* / *Pascopyrum smithii* - (*Elymus lanceolatus*) Shrubland
 - Artemisia tridentata* ssp. *tridentata* / *Pleuraphis jamesii* Shrubland
- ARTEMISIA TRIDENTATA SHRUBLAND ALLIANCE
 - Artemisia tridentata* - (*Ericameria nauseosa*) / *Bromus tectorum* Semi-natural Shrubland
 - Artemisia tridentata* / *Pleuraphis jamesii* Shrubland
- ARTEMISIA TRIDENTATA SSP. WYOMINGENSIS SHRUB HERBACEOUS ALLIANCE
 - Artemisia tridentata* ssp. *wyomingensis* / *Pascopyrum smithii* Shrub Herbaceous Vegetation
 - Artemisia tridentata* ssp. *wyomingensis* / *Pseudoroegneria spicata* Shrub Herbaceous Vegetation
- ARTEMISIA TRIDENTATA SSP. WYOMINGENSIS SHRUBLAND ALLIANCE
 - Artemisia tridentata* ssp. *wyomingensis* - *Atriplex confertifolia* Shrubland
 - Artemisia tridentata* ssp. *wyomingensis* - *Purshia tridentata* / *Pseudoroegneria spicata* Shrubland
 - Artemisia tridentata* ssp. *wyomingensis* / *Achnatherum hymenoides* Shrubland
 - Artemisia tridentata* ssp. *wyomingensis* / *Elymus albicans* Shrubland
 - Artemisia tridentata* ssp. *wyomingensis* / *Leymus ambiguus* Shrubland
 - Artemisia tridentata* ssp. *wyomingensis* / *Pseudoroegneria spicata* Shrubland

Overview: This matrix forming ecological system occurs throughout the much of western U.S. In Colorado, the largest occurrences are in the western half of the state, but this system can also be found in eastern Colorado. Northwestern Colorado, North Park, Middle Park, and the upper Gunnison Basin have large and continuous stands of sagebrush shrublands. This system is characterized by a dense shrubland of taller *Artemesia* species with a significant herbaceous understory. These taller shrubs distinguish it from sagebrush steppe, which is dominated by dwarf sagebrush species.

Characteristic species: These shrublands are dominated by *Artemesia tridentata* ssp. *tridentata* and/or ssp. *wyomingensis*, or *A. cana*, with occasional component shrubs such as *Chrysothamnus* spp., *Purshia tridentata*, and *Krascheninnikovia lanata*. Scattered *Sarcobatus vermiculatus* and *Atriplex* spp. may be present in some stands. *Ericameria nauseosa* or *Chrysothamnus viscidiflorus* may codominate disturbed stands. Perennial herbaceous components typically contribute less than 25% vegetative cover. Common graminoid species include *Achnatherum hymenoides*, *Bouteloua gracilis*, *Carex geyeri*, *Elymus lanceolatus*, *Festuca idahoensis*, *F. thurberi*, *Hesperostipa comata*, *Leymus cinereus*, *Pleuraphis jamesii*, *Pascopyrum smithii*, *Poa secunda*, or *Pseudoroegneria spicata*. Sage-grouse (*Centrocercus* spp.) is an indicator of a healthy sagebrush shrubland.

Environment: Big sagebrush shrublands are typically found in broad basins between mountain ranges, on plains and foothills. This system is usually found on flat to rolling hills with well-drained clay soils between 7,000 to 10,000 feet in elevation. Soils are typically deep, well-drained and non-saline.

Dynamics: Presettlement stand-replacing fire frequency was 40-60 years, with smaller fires every 20-25 years (Wright et al. 1979). Repeated burning every few years or burning in summer will deplete a stand of perennial grasses and allow invasive forbs and cheatgrass to increase. Taller *Artemisia* shrublands are more susceptible to natural fire than dwarf shrublands.

Cheatgrass (*Bromus tectorum*) increases the likelihood of fire in mixed sagerush-cheatgrass sites, but burning may produce dominance of cheatgrass and other weeds. Following a fire sagebrush must reestablish itself from seed; growth is slow and recovery is slow (Bunting et al. 1987). Fire favors shrubs like *Ericameria nauseosus* that can re-sprout after fire. Fire suppression in montane grasslands could lead to conversion to *Artemisia tridentata* shrublands. Heavy grazing increases soil water losses, so heavily grazed sites are drier. Excessive grazing also reduces the biomass of deep (>15 in or 40 cm) roots and reduces the depth and cover of litter. Trampling from livestock grazing significantly decreases the number of sagebrush and grass seedlings.

Variation: This system differs from the sagebrush steppe in that the steppe is dominated by dwarf sagebrush (*Artemisia arbuscula* and *A. nova*). The dwarf shrublands are often found on poorly drained soils with low aeration, whereas the big sagebrush shrublands are usually on well drained and aerated soils.



P. Lyon

Bunting, S.C., B.M. Kilgore, and C.L. Bushey. 1987. Guidelines for prescribed burning sagebrush-grass rangelands in the northern Great Basin. General Technical Report INT-231, 33 pp. USDA Forest Service, Intermountain Research Station. Ogden, UT.

Wright, H.A., L.F. Neuenschwander, and C.M. Britton. 1979. The role and use of fire in sagebrush-grass and pinyon-juniper plant communities: A state-of-the-art review. General Technical Report INT-58, 48 pp. USDA Forest Service, Intermountain Research Station. Ogden, UT.

Rank:	A	B	C	D
① SIZE				
Acres	>90,000	50,000-90,000	30,000-50,000	< 30,000
② CONDITION				
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.	<5% cover, native species dominant.	<10% cover, native species dominant.	Co-dominant with native species.	Dominant.
Native increaser spp. (<i>Balsamorhiza</i> , <i>Wyethia</i> , <i>Gutierrezia sarothrae</i>)	< 3% cover.	<10% cover.	>10% cover.	May be dominant.
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.
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.	Disturbance has had notable impact on species composition, soil compaction, and soil erosion.
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.