

10862

Rocky Mountain Lower Montane-Foothill Shrubland - True Mountain Mahogany

BpS Model/Description Version: Aug. 2020

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Vegetation Type

Shrubland

Map Zone

22

Model Splits or Lumps

This Biophysical Setting (BpS) is split into multiple models: 1086 was split in order to accommodate the mountain-mahogany portion of 1086, which does function differently than the rest of the shrub component of 1086. True mountain mahogany is being split from 1086 due to different fire intervals, range, and effects. It can be distinguished from the rest of 1086 by aspect -- more exposed aspects and shallower, rocky soils for true mountain-mahogany.

Geographic Range

Foothills, canyon slopes, and lower mountains of the Rocky Mountains. The description here focuses on true mountain-mahogany. Information in the FEIS online database indicates that the central distribution of true mountain-mahogany is located on the west side of the Rocky Mountains in the foothills and mountains of Utah, Colorado, and Wyoming. The range of true mountain-mahogany also extends north into Montana, east into South Dakota and Nebraska, south from Oklahoma into Mexico, and west into Arizona and Nevada.

It occurs in every section of map zone (MZ) 22. It is questionable as to whether true mountain-mahogany exists in the Bighorn Basin.

Biophysical Site Description

This BpS ranges from roughly 4,400-8,500ft. This BpS occurs on relatively xeric sites with thinly to moderately well-developed soils on moderately steep to steep southerly aspects.

Vegetation Description

Species dominance varies depending on site conditions and by geographic location. Shrubs include *Cercocarpus montanus*, *Amelanchier utahensis*, *Purshia tridentata*, *Rhus trilobata*, *Ribes cereum*, *Symphoricarpus oreophilus*, *Yucca glauca*, sagebrush, bitterbrush, serviceberry, and rabbitbrushes.

Grasses may include species of *Hesperostipa*, *Pseudoroegneria spicata*, Indian ricegrass, and western wheatgrass.

BpS Dominant and Indicator Species

Symbol	Scientific Name	Common Name
CEMO2	<i>Cercocarpus montanus</i>	Alderleaf mountain mahogany
ARTRV	<i>Artemisia tridentata ssp. vaseyana</i>	Mountain big sagebrush
PSSP6	<i>Pseudoroegneria spicata</i>	Bluebunch wheatgrass
ACHY	<i>Achnatherum hymenoides</i>	Indian ricegrass

Species names are from the NRCS PLANTS database. Check species codes at <http://plants.usda.gov>.

Disturbance Description

Historically, this type may have had a fire regime of primarily long-interval stand-replacement fires. Nearly all the dominant species other than sagebrush in this BpS have the capability to resprout after disturbance.

Drought and grazing by native ungulates also occur in this system.

Fire Frequency

Severity	Avg FI	Percent of All Fires	Min FI	Max FI
Replacement	106	100		
Moderate (Mixed)				
Low (Surface)				
All Fires	106	100		

Fire interval is expressed in years for each fire severity class and for all types of fire combined (All Fires). Average FI is the central tendency modeled. Percent of all fires is the percent of all fires modeled in that severity class. Minimum and Maximum FIs show the relative range of fire intervals as estimated by model contributors, if known.

Scale Description

Erhard's observations suggest that the scale of the most common disturbance extent is relatively small. Patch size of the system is in the 100s of acres.

Adjacency or Identification Concerns

Cheatgrass is present in this system today.

This split system may be confused with the sometimes adjacent original 1086 (2210861); however, they should be distinguished.

There is occasionally Rocky Mountain juniper and limber pine encroachment into this system.

Issues or Problems

Native Uncharacteristic Conditions

Comments

The model for MZ22 was adapted from the model for the same BpS from MZ28 created by Dean Erhard (derhard@fs.fed.us) and reviewed by Vic Ecklund, Chuck Kostecka, and an anonymous reviewer. Other modelers for MZ22 were Jay Esperance, Carl Bezanson, and Tim Kramer. The model and description for MZ22 differs quantitatively and descriptively from MZ28, as the model for MZ22 is split between true mountain-mahogany and other shrubs. The model being discussed here is that for true mountain-mahogany. MZ22 10861 is also lumped with 1106 for MZ22.

The model for MZ28 was based on the Rapid Assessment model R3MSHB. Mike Babler made edits 16 June 2005. R3MSHB reviewers were Barry Johnston, bcjohnston@fs.fed.us, Brenda Wilmore, bwhilmore@fs.fed.us, Tim Christiansen, christta@wsmr.army.mil, and Bill Baker, bakerwl@wyo.edu.

Succession Classes

Mapping Rules

Upper Layer Lifeform	Height (m)	Canopy Cover (%)									
		0-10	11-20	21-30	31-40	41 - 50	51-60	61-70	71-80	81-90	91-100
Herb	0-0.5	A	A	A	A	A	A	A	A	A	A
Herb	0.5-1.0	A	A	A	A	A	A	A	A	A	A
Herb	>1.0	A	A	A	A	A	A	A	A	A	A
Shrub	0-0.5	B	B	C	C	C	C	C	C	C	C
Shrub	0.5-1.0	B	B	C	C	C	C	C	C	C	C
Shrub	1.0-3.0	B	B	C	C	C	C	C	C	C	C
Shrub	>3.0	B	B	C	C	C	C	C	C	C	C
Tree	0-5	C	C	C	C	C	UN	UN	UN	UN	UN
Tree	5-10	C	C	C	C	C	UN	UN	UN	UN	UN
Tree	10-25	C	C	C	C	C	UN	UN	UN	UN	UN
Tree	25-50	C	C	C	C	C	UN	UN	UN	UN	UN
Tree	>50	C	C	C	C	C	UN	UN	UN	UN	UN

Succession class letters A-E are described in the Succession Class Description section. Some classes use a leafform distinction where a qualifier is added to the class letter: Brdl (broadleaf), Con (conifer), or Mix (mixed conifer and broadleaf). UN refers to uncharacteristic native or a combination of height and cover that would not be expected under the reference condition. NP refers to not possible or a combination of height and cover which is not physiologically possible for the species in the BpS.

Description

Class A 5 Early Development 1 - Open

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
CEMO2	Cercocarpus montanus	Alderleaf mountain mahogany	Upper
PSSP6	Pseudoroegneria spicata	Bluebunch wheatgrass	Upper

Description

Early seral community. Grasses and sprouting shrubs. Shrub cover might be 0-5% (the canopy cover of true mountain-mahogany resprouts was <3%, as per plot data 18mo after a prescribed fire). Resprouts well after fire. Some grasses that might be present are needle-and-thread, bluebunch wheatgrass, Sandberg bluegrass, blue grama, and western wheatgrass. Hairy golden aster was the most dominant of a wide variety of forbs.

None

Indicator Species

Description

Maximum Tree Size Class

None

Indicator Species

Description

Maximum Tree Size Class

None

Deterministic Transitions

Probabilistic Transitions

Disturbance Type	Disturbance occurs In	Moves vegetation to	Disturbance Probability	Return Interval (yrs)	Reset Age to New Class Start Age After Disturbance?	Years Since Last Disturbance
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Wind or Weather or Stress	Early1:OPN	Early1:OPN	0.005	200	No	0
Replacement Fire	Early1:OPN	Early1:OPN	0.005	200	Yes	0
Native Grazing	Early1:OPN	Early1:OPN	0.005	200	No	0
Wind or Weather or Stress	Mid1:OPN	Mid1:OPN	0.005	200	No	0
Replacement Fire	Mid1:OPN	Early1:OPN	0.0067	149	Yes	0
Wind or Weather or Stress	Late1:OPN	Late1:OPN	0.003	333	No	0
Replacement Fire	Late1:OPN	Early1:OPN	0.01	100	Yes	0

References

Arno, S.F. and G.E. Gruell. 1983. Fire history at the forest-grassland ecotone in southwestern Montana. *Journal of Range Management* 36: 332-336.

Arno, S.F. and G.E. Gruell. 1986. Douglas-fir encroachment into mountain grasslands in southwestern Montana. *Journal of Range Management* 39: 272-275.

Arno, S.F. and A.E. Wilson. 1986. Dating past fires in curlleaf mountain-mahogany communities. *Journal of Range Management* 39(3): 241-243.

Bunting, S.C., L.F. Neuenschwander and G.E. Gruell. 1985. Fire ecology of antelope bitterbrush in the Northern Rocky Mountains. Pages 48-57 in: J.E. Lotan and J.K. Brown, compilers. *Fire's Effects on Wildlife Habitat— Symposium Proceedings*. March 21, 1984, Missoula, Montana. Gen. Tech. Rep. INT-186. Ogden, UT: USDA Forest Service, Intermountain Research Station.

Erdman, J.A. 1970. Pinon-juniper succession after natural fires on residual soils of Mesa Verde, Colorado. *Brigham Young University Biological Series* Vol. XI (2). 58 pp.

Floyd, M.L, W.H. Romme and D.D. Hanna. 2000. Fire History and vegetation pattern in Mesa Verde National Park, Colorado, USA. *Ecological Applications* 10: 1666-1680.

Gruell, G.E., S.C. Bunting and L.F. Neuenschwander. 1985. Influence of fire on curlleaf mountain-mahogany in the Intermountain West. Pages 58-71 in: J.E. Lotan and J.K. Brown, compilers. *Fire's Effects on Wildlife Habitat— Symposium Proceedings*. March 21, 1984, Missoula, Montana. Gen. Tech. Rep. INT-186. Ogden, UT: USDA Forest Service, Intermountain Research Station.

Johnston, B.C., L. Huckaby, T.J. Hughes and J. Pecor. 2001. Ecological types of the Upper Gunnison Basin: Vegetation-soil-landform-geology-climate-water land classes for natural

resource management. Technical Report R2-RR-2001-01, 858 pp. Lakewood, CO: USDA Forest Service, Rocky Mountain Region. May, 2001.

Keeley, J.E. and S.C. Keely. 1988. Chaparral. Chapter 6 (pages 165-207) in: Barbour, M.G. and W.D. Billings (editors). North American terrestrial vegetation. Cambridge Univ. Press, Cambridge, England.

Martin, R.E. and C.H. Driver 1983. Factors affecting antelope bitterbrush reestablishment following fire. Pages 266-279 in: A.R. Tiedemann and K.L. Johnson, compilers. Research and management of bitterbrush and cliffrose in western North America. Gen. Tech. Rep. INT-152. Ogden, UT: USDA Forest Service, Intermountain Forest and Range Experiment Station.

Mueggler, W.F. and W.L. Stewart. 1980. Grassland and shrubland habitat types of western Montana. Gen. Tech. Rep. INT-66. Ogden, UT: USDA Forest Service, Intermountain Forest and Range Experiment Station, 154 pp.

NatureServe. 2005. NatureServe Explorer: An online encyclopedia of life [web application]. Version 4.4. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: May 3, 2005).

NatureServe. 2007. International Ecological Classification Standard: Terrestrial Ecological Classifications. NatureServe Central Databases. Arlington, VA. Data current as of 10 February 2007.

Omi, P. and L. Emrisk. 1980. Fire and resource management in Mesa Verde National Park. Contract CS-1200-9-B015. Unfinished report, on file at Mesa Verde National Park.

Paysen, T.E., J.R. Ansley, J.K. Brown, G.J. Gottfried, S.M. Haase, M.J. Harrington, M.G. Narog, S.S. Sackett and R.C. Wilson. Chapter 6: Fire in Western Shrubland, Woodland, and Grassland Ecosystems. Pages 121-160 in: J.K. Brown and J. Kapler-Smith, eds. Wildland fire in ecosystems: effects of fire on flora. Gen. Tech. Rep. RMRS-GTR-42-vol. 2. Ogden, UT: USDA Forest Service, Rocky Mountain Research Station. 257 pp.

Rice, C.L. 1983. A literature review of the fire relationships of antelope bitterbrush. Pages 256-265 in: A.R. Tiedemann and K.L. Johnson, compilers. Research and management of bitterbrush and cliffrose in western North America. Gen. Tech. Rep. INT-152. Ogden, UT: USDA Forest Service, Intermountain Forest and Range Experiment Station.

Romme, W.H., P. Barry, D. Hanna, and S. White. A wildlife hazard map for La Plata County, Colorado. Final report to the San Juan National Forest, Durango, CO.

Schmidt, K.M., J.P. Menakis, C.C. Hardy, W.J. Hann and D.L. Bunnell. 2002. Development of coarse-scale spatial data for wildland fire and fuel management. Gen. Tech. Rep. RMRS-GTR-87. Fort Collins, CO: USDA Forest Service, Rocky Mountain Research Station. 41 pp. + CD.

Shiflet, T.N., ed. 1994. Rangeland cover types of the United States. Denver, CO: Society for Range Management. 152 pp.

Spencer, J.R., W.H. Romme, L. Floyd-Hanna and P.G. Rowlands. 1995. A preliminary vegetation classification for the Colorado Plateau. Pages 193-213 in: C. van Riper III (editor), Proceedings for the second biennial conference on research in Colorado Plateau national parks. National Park Service Transactions and Proceedings Series NPS/NRNAU/NRTP-95/11.

Spencer, A.W. and W.H. Romme. 1996. Ecological patterns, Pages 129-142 in: R. Blair (managing editor), The western San Juan Mountains: their geology, ecology, and human history. University Press of Colorado, Niwot, CO.

USDA Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (2002, December). Fire Effects Information System, [Online]. Available: <http://www.fs.fed.us/database/feis/> [Accessed 6/25/03].

Wright, H.A. 1971. Shrub response to fire. Pages 204-217 in: Wildland shrubs—their biology and utilization. Gen. Tech. Rep. INT-1. Ogden, UT: USDA Forest Service, Intermountain Forest and Range Experiment Station.