10860

Rocky Mountain Lower Montane-Foothill Shrubland

BpS Model/Description Version: Aug. 2020

Vegetation Type

Shrubland

Map Zone

28

Geographic Range

Foothills, canyon slopes, and lower mountains of the Rocky Mountains. The general information provided in this form is based on personal experience in the upper Rio Grande drainage (specifically the Rio Grande National Forest [Erhard]). The description here focuses more on true mountain-mahogany. Information in the Fire Effects Information System 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 northward into Montana, eastward into South Dakota and Nebraska, southward from Oklahoma into Mexico, and westward into Arizona and Nevada. True mountain-mahogany occasionally occurs in Idaho and southwestern Oregon.

Biophysical Site Description

This biophysical setting (BpS) occurs in the transition zone between the foothill and montane life zones. It ranges from roughly 1,500-2,900m (4,950-9,570ft). This BpS occurs on relatively xeric sites with thinly to moderately well-developed soils on moderately steep to steep southerly aspects. This BpS is not intended to cover ocean spray (HODU)-dominated communities on extremely rocky sites (where vegetation is clearly subordinate to rock).

Vegetation Description

Species dominance varies depending on site conditions and geographic location. Shrubs include *Amelanchier utahensis*, *Cercocarpus montanus*, *Purshia tridentata*, *Rhus trilobata*, *Ribes cereum*, *Symphoricarpus oreophilus*, and *Yucca glauca*. Grasses may include species of *Bouteloua*, *Muhlenbergia*, *Hesperostipa*, and *Pseudoroegneria*. Species dominant in the upper Rio Grande drainage are true mountain-mahogany, several species of rabbitbrush, snowberry, and chokecherry. Gambel oak is not included here.

BpS Dominant and Indicator Species

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

Disturbance Description

Historically, this type may have been in a Fire Regime IV or II -- primarily moderate-interval (e.g., 20-50yrs) stand-replacement fires in the shrub-dominated layer. Nearly all the dominant species in this BpS have the capability to resprout after disturbance.

Fire Frequency

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. The disturbance regime is expected to be relatively frequent under historical conditions. Scale estimate is in the hundreds of acres, not thousands of acres.

Adjacency or Identification Concerns

Shrub species vary by geographic location in this region. Shrub species dominance is tied to a variety of environmental conditions, including geology, soils, topographic position, etc., making a description of this generalized type problematic.

Issues or Problems

Native Uncharacteristic Conditions

Comments

Succession Classes

**Mapping Rules**

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 14 Early Development 1 - All Structures

Indicator Species

Description

Early succession, usually after moderately frequent stand-replacement fire. Grasses and forbs dominant.

*Maximum Tree Size Class*  
None

Class B 16 Mid Development 1 - Closed

Upper Layer Lifeform Is Not the Dominant Lifeform

BOGR2, herb short (0.4m) to herb medium (0.05-0.09 m). Canopy cover 0-20%.

Indicator Species

Description

Greater than 10% shrub cover (i.e., line intercept method) by weakly sprouting and seed-producing shrubs. Grasses/forbs dominant in scattered openings.

*Maximum Tree Size Class*  
None

Class C 6 Mid Development 1 - Open

Upper Layer Lifeform Is Not the Dominant Lifeform

BOGR2, herb short (0.05m) to herb medium (0.5-0.9m). Twenty to 60% canopy cover

Indicator Species

Description

Less than 10% shrub cover, with grasses/forbs dominant in extensive openings.

*Maximum Tree Size Class*  
None

Class D 10 Late Development 1 - Open

Upper Layer Lifeform Is Not the Dominant Lifeform

CEMO, shrub short (0.5-0.9m), shrub medium (1.0-2.9m).

Indicator Species

Description

Less than 10% shrub cover, with over-mature shrubs as patchy, dominant overstory (e.g., in rock outcrops). Grasses/forbs dominant in extensive openings.

*Maximum Tree Size Class*  
None

Class E 54 Late Development 1 - Closed

Indicator Species

Description

Greater than 10% shrub cover. All age classes present, but dominated by over-mature shrubs (e.g., in rocky draws).

*Maximum Tree Size Class*  
None

Model Parameters

Deterministic Transitions

Probabilistic Transitions

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. May, 2001. Lakewood, CO: USDA Forest Service, Rocky Mountain Region. 858 pp.

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.