10950

Apacherian-Chihuahuan Mesquite Upland Scrub

BpS Model/Description Version: Aug. 2020

|  |  |  |  |
| --- | --- | --- | --- |
| **Modelers** |  | **Reviewers** |  |
| Mark Pater | mark\_pater@blm.gov | Phil Smith | Phil\_Smith@nm.blm.gov |
| None | None | Keith Schulz | Keith\_Schulz@natureserve.org |
| None | None | None | None |

Vegetation Type

Shrubland

Map Zone

25

Geographic Range

Chihuahuan Desert extending into the Sky Island region to the west and the Edwards Plateau to the east.

Biophysical Site Description

Substrates are typically derived from alluvium, often gravelly without a well-developed argillic or calcic soil horizon that would limit infiltration and storage of winter precipitation in deeper soil layers. *Prosopis* spp. and other deep-rooted shrubs exploit the deep soil moisture, which is unavailable to grasses and cacti.

Vegetation Description

Vegetation is typically dominated by *Prosopis glandulosa* or *Prosopis velutina* and succulents. Other desert scrub that may co-dominate or dominate includes *Acacia neovernicosa*, *Acacia constricta*, *Juniperus monosperma*, or *Juniperus coahuilensis*. Grass species may include *Bouteloua curtipendula*, *Aristida purpurea*, *Muhlenbergia porteri*, *Bothriochloa barbinodis*, *Setaria leucopila*, and perhaps *Vulpia* spp. The deeper soils within this biophysical setting help support good grass cover beneath the shrub canopy. Higher annual rainfall and deeper soils in this BpS, compared to a Sonoran desert location, allow for a more diverse plant community.

BpS Dominant and Indicator Species

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** |
| BOUTE | *Bouteloua* | Grama |
| PLMU3 | *Pleuraphis mutica* | Tobosagrass |
| ARIST | *Aristida* | Threeawn |
| MUPO2 | *Muhlenbergia porteri* | Bush muhly |
| ISTE | *Isoetes tegetiformans* | Merlin's grass |
| PRJU3 | *Prosopis juliflora* | Prosopis juliflora |
| ACACI | *Acacia* | Acacia |

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

Disturbance Description

Drought is a relatively common occurrence in this BpS, generally occurring every 10-15yrs and lasting 2-3yrs. Occasional long-term drought (duration, 10-15yrs) affects this BpS. Historical natural ignition fires in this BpS were probably 10-15ac in size. Fire helped maintain a general mosaic pattern between open grassland and shrub-dominated areas.

Fire Frequency

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Severity** | **Avg FI** | **Percent of All Fires** | **Min FI** | **Max FI** |
| Replacement | 10 | 83 |  |  |
| Moderate (Mixed) |  |  |  |  |
| Low (Surface) | 48 | 17 |  |  |
| All Fires | 8 | 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

Patch size of this BpS ranges from 50-1,000,000ha (from literature).

Adjacency or Identification Concerns

Similar to Chihuahuan Mixed Desert and Thorn Scrub (CES302.734) but is generally found at higher elevations where *Larrea* *tridentata* and other desert scrub are not co-dominant. It is also similar to Chihuahuan Stabilized Coppice Dune and Sand Flat Scrub (CES302.737), but does not occur on eolian-deposited substrates.

Issues or Problems

This is probably not a BpS, but may be a class within semi-desert grassland (BpS 1121). During the past century, the area occupied by this system has increased through conversion of desert grasslands as a result of drought, overgrazing by livestock, and/or a decrease in fire frequency. It is believed that this is a system that occurred in very minor amounts and has become widespread as a result of drought, heavy grazing, and other actions.

Native Uncharacteristic Conditions

Comments

251095 is based on 151095 (Mike Babler, October 2005). 151095 was based on information provided by Heather Schussman (hschussman@tnc.org). The VDDT model is the same as 151121. Review suggests that this BpS occupies <5% of semi-desert grassland (BpS 1121) and is not its own BpS. Review of map zone 25 by Christiansen agrees this may be a subset and not a separate BpS. Reviewer Smith and modeler Pater state there is enough difference to warrant both BpS 251095 and 251121. Joel Brown states that mesquite was confined mostly to drainages until cattle distributed seed.

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 | B | B | B | B | B |
| Herb | 0.5-1.0 | A | A | A | A | A | B | B | B | B | B |
| Herb | >1.0 | A | A | A | A | A | B | B | B | B | B |
| Shrub | 0-0.5 | B | B | C | C | D | D | D | D | D | D |
| Shrub | 0.5-1.0 | B | B | C | C | D | D | D | D | D | D |
| Shrub | 1.0-3.0 | B | B | C | C | D | D | D | D | D | D |
| Shrub | >3.0 | B | B | C | C | D | D | D | D | D | D |
| Tree | 0-5 | D | D | D | D | D | UN | UN | UN | UN | UN |
| Tree | 5-10 | D | D | D | D | D | UN | UN | UN | UN | UN |
| Tree | 10-25 | D | D | D | D | D | UN | UN | UN | UN | UN |
| Tree | 25-50 | D | D | D | D | D | UN | UN | UN | UN | UN |
| Tree | >50 | D | D | D | D | D | 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 20 Early Development 1 - All Structures

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| BOCU | Bouteloua curtipendula | Sideoats grama | Upper |
| MUPO2 | Muhlenbergia porteri | Bush muhly | Upper |
| ARIST | Aristida | Threeawn | Upper |
| IPER | Ipomoea eriocarpa | Morning glory | Lower |

Description

Grasses and forbs. Early succession post-fire grass and forb community dominated by perennial bunchgrasses, annual grasses, and forbs. Upper layer of shrub canopy cover typically <5%.

*Maximum Tree Size Class*  
None

Class B 65 Mid Development 1 - Open

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| BOCU | Bouteloua curtipendula | Sideoats grama | Low-Mid |
| MUPO2 | Muhlenbergia porteri | Bush muhly | Low-Mid |
| PROSO | Prosopis | Mesquite | Upper |
| ACACI | Acacia | Acacia | Upper |

Description

Grasses with some low shrubs. Perennial bunchgrasses regenerated and young shrubs begin growing. Species are perennial bunchgrasses and shrubs. Canopy cover of upper layer is typically 5-10%.

*Maximum Tree Size Class*  
None

Class C 9 Mid Development 2 - Open

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| PROSO | Prosopis | Mesquite | Upper |
| ACACI | Acacia | Acacia | Mid-Upper |
| ISTE2 | Isocoma tenuisecta | Burroweed | Lower |
| MUPO2 | Muhlenbergia porteri | Bush muhly | Lower |

Description

Shrubs continue to increase in size and/or number of individuals. Species are perennial bunchgrasses and shrubs.

*Maximum Tree Size Class*  
None

Class D 6 Late Development 1 - Open

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| PROSO | Prosopis | Mesquite | Upper |
| ACACI | Acacia | Acacia | Upper |
| ISTE2 | Isocoma tenuisecta | Burroweed | Low-Mid |
| MUPO2 | Muhlenbergia porteri | Bush muhly | Lower |

Description

Shrub-dominated landscape with scant perennial grass cover. Shrub cover and densities are high enough to outcompete perennial grasses, resulting in low levels of fine fuel and increased erosion potential.

*Maximum Tree Size Class*  
None

Model Parameters

Deterministic Transitions

|  |  |  |  |
| --- | --- | --- | --- |
| **From Class** | **Begins at (yr)** | **Succeeds to** | **After (years)** |
| Early1:ALL | 0 | Mid1:OPN | 2 |
| Mid1:OPN | 3 | Mid2:OPN | 14 |
| Mid2:OPN | 15 | Late1:OPN | 21 |
| Late1:OPN | 22 | Late1:OPN | 999 |

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** |
| Surface Fire | Mid1:OPN | Mid1:OPN | 0.0167 | 60 | No | 0 |
| Replacement Fire | Mid1:OPN | Early1:ALL | 0.14 | 7 | Yes | 0 |
| Surface Fire | Mid2:OPN | Mid2:OPN | 0.0167 | 60 | No | 0 |
| Replacement Fire | Mid2:OPN | Early1:ALL | 0.12 | 8 | Yes | 0 |
| Surface Fire | Late1:OPN | Late1:OPN | 0.0167 | 60 | No | 0 |
| Surface Fire | Late1:OPN | Mid1:OPN | 0.12 | 8 | Yes | 0 |

References

Brooks, M.L., T.C. Esque and T. Duck. 2003. Fuels and fire regimes in creosotebush, blackbrush, and interior chaparral shrublands. Report for the Southern Utah Demonstration Fuels Project, USDA Forest Service, Rocky Mountain Research Station, Fire Science Lab, Missoula, Montana. 17 pp.

Brown, D.E. and R.A. Minnich. 1986. Fire and creosote bush scrub of the western Sonoran Desert, California. American Midland Naturalist 116: 411-422.

Brown, D.E., editor. 1982. Biotic communities -- southwestern United States and northwestern Mexico. Desert Plants 4(1-4): 1-342.

Brown, J.K. and J. Kapler-Smith, eds. 2000. 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.

Dick-Peddie, W.A. 1993. New Mexico vegetation: Past, present, and future. Albuquerque, NM: University of New Mexico Press. 244 pp.

Henrickson, J. and M.C. Johnston. 1986. Vegetation and community types of the Chihuahuan Desert. Pages 20-39 in: J.C. Barlow, A.M. Powell and B.N. Timmermann, eds. Chihuahuan Desert--U.S. and Mexico, II: Proceedings of the 2nd symposium on resources of the Chihuahuan Desert region; 1983 October 20-21; Alpine, TX. Alpine, TX: Sul Ross State University, Chihuahuan Desert Research Institute.

Kuchler, A.W. 1964. Manual to accompany the map of potential natural vegetation of the conterminous United States. American Geographical Society. Spec. Publ. NO. 36. Lib. Congress Cat. Card Num. 64-15417.

Marshall, K.A. 1995. Larrea tridentata. In: Fire Effects Information System, [Online]. USDA Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2004, November 14].

Matthews, R.F. 1994. Fouquieria splendens. In: Fire Effects Information System, [Online]. USDA Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2005, October 7].

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

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. 2000. Chapter 6: Fire in western shrubland, woodland, and grassland ecosystems. Pages 121-159 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.

Uchytil, R.J. 1990. Agave lechuguilla. In: Fire Effects Information System, [Online].

USDA Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2005, October 7].

USDA-NRCS. 2005. Nevada Rangeland Ecological Site Description. 0300XB078NV, 030XB019NV. Available online: http://esis.sc.egov.usda.gov/Welcome/pgESDWelcome.aspx.

Webster, G.L and C.J. Bahre, eds. 2001 Changing Plant Life of La Frontera: Observations on vegetation in the United States/Mexico Borderlands. University of New Mexico Press, Albuquerque, NM.