11000

Chihuahuan Mixed Desert and Thornscrub

BpS Model/Description Version: Aug. 2020

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Vegetation Type

Shrubland

Map Zone

26

Geographic Range

This rings Chihuahuan Desert basins from southern Arizona to Trans-Pecos Texas and extensively southward into Mexico and occurs on lower elevation sloping plains and tablelands.

Biophysical Site Description

This Biophysical Setting (BpS) represents a limited extent of *Larrea*-dominated shrublands occurring historically on generally gravelly, lower bajada slopes and gently sloping calcareous gravelly plains. This type occurs generally from the lowest desert elevations to about 5,000ft. The current distribution of *Larrea* is much expanded within this environmental site potential and was previously dominated by a grassland/steppe. Under current conditions, at lower elevations, this transitions into creosote-dominated basins (BpS1074), although the basin shrubland may have been extremely limited or absent historically, replacing grasslands on these fine-textured soils.

Vegetation Description

Vegetation is characterized by creosote bush (*Larrea tridentata*) mixed with thornscrub and other desert scrub such as lechuguilla (*Agave lechuguilla*), Wright’s beebrush (*Aloysia wrightii*), ocotillo (*Fouquieria splendens*), green sotol (*Dasylirion leiophyllum*), American tarwort (*Flourensia cernua*), big bend barometerbush (*Leucophyllum minus*), catclaw mimosa (*Mimosa aculeaticarpa* var. *biuncifera*), Rio Grande saddlebush (*Mortonia sempervirens*), cactus apple (*Opuntia engelmannii*), mariola (*Parthenium incanum*), honey mesquite (*Prosopis glandulosa*), and plumed crinklemat (*Tiquilia greggii*). Stands of thornscrub dominated by whitethorn acacia (*Acacia constricta*) or viscid acacia (*A. neovernicosa*) or catclaw acacia (*A. greggii*) are included in this system, and limestone substrates appear important for at least these species. Black grama (*Bouteloua eriopoda*) may have been common but generally had lower cover than shrubs.

BpS Dominant and Indicator Species

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** |
| LATR2 | *Larrea tridentata* | Creosote bush |
| AGLE | *Agave lechuguilla* | Lechuguilla |
| ACACI | *Acacia* | Acacia |
| DALE2 | *Dasylirion leiophyllum* | Green sotol |
| FOSP2 | *Fouquieria splendens* | Ocotillo |
| BOER4 | *Bouteloua eriopoda* | Black grama |

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

Disturbance Description

Fire was a minor influence in this type with no other significant disturbance factor.

Fire Frequency

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Severity** | **Avg FI** | **Percent of All Fires** | **Min FI** | **Max FI** |
| Replacement |  |  |  |  |
| Moderate (Mixed) |  |  |  |  |
| Low (Surface) |  |  |  |  |
| All Fires |  |  |  |  |

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

Small patch

Adjacency or Identification Concerns

At lower, more xeric conditions, this transitions to BpS1074. At higher, more mesic elevations, this type is bordered by grasslands.

Issues or Problems

A related BpS (1121), historically dominated by grasses, has been replaced by this BpS, which now represents a widespread and pervasive existing vegetation type. Inappropriate grazing in this arid environment has led to decline in grass cover, resulting in dominance of *Larrea*, loss of topsoil, and expansion of this shrubland type into adjacent degraded grasslands. Return to a heterogeneous *Larrea*/grassland mosaic would require significant inputs and restoration action.

Native Uncharacteristic Conditions

Comments

We speculate that this represents the pre-settlement distribution of *Larrea*-dominated communities within the Chihuahuan Desert. It is possible that *Larrea* occurring in these pre-settlement landscapes was confined by competition from a healthy and vigorous grass cover that may have precluded *Larrea* expansion and, following anthropogenic degradation (namely grazing in concert with the extreme, and likely increasingly, xeric conditions), prospered and expanded from an ecological release mechanism.

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 | UN | UN | UN |
| Herb | 0.5-1.0 | A | A | A | A | A | A | A | UN | UN | UN |
| Herb | >1.0 | A | A | A | A | A | A | A | UN | UN | UN |
| Shrub | 0-0.5 | A | A | A | A | A | A | A | UN | UN | UN |
| Shrub | 0.5-1.0 | A | A | A | A | A | A | A | UN | UN | UN |
| Shrub | 1.0-3.0 | A | A | A | A | A | A | A | UN | UN | UN |
| Shrub | >3.0 | A | A | A | A | A | A | A | UN | UN | UN |
| Tree | 0-5 | A | A | UN | UN | UN | UN | UN | UN | UN | UN |
| Tree | 5-10 | A | A | UN | UN | UN | UN | UN | UN | UN | UN |
| Tree | 10-25 | A | A | UN | UN | UN | UN | UN | UN | UN | UN |
| Tree | 25-50 | UN | UN | UN | UN | UN | UN | UN | UN | UN | UN |
| Tree | >50 | UN | UN | UN | UN | UN | 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 100 Early Development 1 - All Structures

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| LATR2 | Larrea tridentata | Creosote bush | Upper |
| AGLE | Agave lechuguilla | Lechuguilla | Low-Mid |
| ACACI | Acacia | Acacia | Mid-Upper |
| BOER4 | Bouteloua eriopoda | Black grama | Lower |

Description

This type is probably edaphically controlled with no significant disturbance types.

*Maximum Tree Size Class*  
None

Model Parameters

Deterministic Transitions

|  |  |  |  |
| --- | --- | --- | --- |
| **From Class** | **Begins at (yr)** | **Succeeds to** | **After (years)** |
| Early1:ALL | 0 | Early1:ALL | 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** |

References

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.

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/ [14 November 2004].

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].

Muller, C. 1940. Plant succession in the Larrea-Flourensia climax. Ecology 21(2): 206-212.

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. 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.

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/ [7 October 2005].