10770

Chihuahuan Succulent Desert Scrub

BpS Model/Description Version: Aug. 2020

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| --- | --- | --- | --- |
| **Modelers** |  | **Reviewers** |  |
| Mike Babler | mbabler@tnc.org | None | None |
| Keith Schulz | Keith\_Schulz@natureserve.org | None | None |
| None | None | None | None |

Vegetation Type

Shrubland

Map Zone

15

Geographic Range

This ecological system is found in the Chihuahuan Desert.

Biophysical Site Description

This system occurs on sparse rocky sites and on bare ground on colluvial slopes, upper bajadas, sideslopes, ridges, canyons, hills, and mesas. Sites are hot and dry. Gravel and rock are often abundant on the ground surface.

Vegetation Description

Vegetation is characterized by the relatively high cover of succulent species such as *Agave lechuguilla*, *Euphorbia antisyphilitica*, *Fouquieria splendens*, *Ferocactus* spp., *Opuntia engelmannii*, *Opuntia imbricata*, *Opuntia spinosior*, *Yucca baccata*, and many others. Perennial grass cover is generally low. The abundance of succulents is diagnostic of this desert scrub system, but scattered desert shrubs are usually present. This system does not include desert grasslands or shrub-steppe with a strong cacti component.

BpS Dominant and Indicator Species

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** |
| AGLE | *Agave lechuguilla* | Lechuguilla |
| FOSP2 | *Fouquieria splendens* | Ocotillo |
| OPIM | *Opuntia imbricata* | Tree cholla |
| OPEN3 | *Opuntia engelmannii* | Cactus apple |
| OPSP2 | *Opuntia spinosior* | Walkingstick cactus |
| DASYL | *Dasylirion* | Sotol |
| ECHIN3 | *Echinocereus* | Hedgehog cactus |

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

Disturbance Description

Fire is extremely rare. Extended drought could set back. Fire following several wet seasons may occur. Adjacent grassland or desert scrub may carry fire into this Biophysical Setting (BpS). Fires in general are not prevalent over much of the range of ocotillo. Although desert vegetation rarely burns completely due to a lack of continuous fuels, unusually heavy winter rains may produce a cover of annual species dense enough to carry a fire when cured. Fires resulting from this situation tend to occur at the desert shrub-desert grassland ecotone or in tobosa (*Hilaria mutica*) or sacaton (*Sporobolus* spp.) swales, which are common habitats for ocotillo. Thomas has estimated that fire frequency in the Sonoran Desert is >250yrs but has cited references suggesting that fire intervals in adjacent desert grasslands may be as short as 3-40yrs.

Fire Frequency

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Severity** | **Avg FI** | **Percent of All Fires** | **Min FI** | **Max FI** |
| Replacement | 348 | 100 |  |  |
| Moderate (Mixed) |  |  |  |  |
| Low (Surface) |  |  |  |  |
| All Fires | 348 | 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

Small patches, usually <1.0ha, could be linear along rock ridges in bands.

Adjacency or Identification Concerns

If there is a high canopy cover of perennial grasses (>20%), the system may be Apacherian Chihuahuan Semi-Desert Grassland and Steppe. These two types may be very difficult to detect via remote sensing.

Issues or Problems

Native Uncharacteristic Conditions

If there is a high canopy cover of perennial grasses (>20%), the system may be Apacherian Chihuahuan Semi-Desert Grassland and Steppe. These two types may be very difficult to detect via remote sensing.

Comments

Tim Christiansen, Esteban Muldavin should review.

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 | A | A | A | A | A | A | A | A | A | A |
| Shrub | 0.5-1.0 | B | B | B | B | B | B | B | B | B | B |
| Shrub | 1.0-3.0 | B | B | B | B | B | B | B | B | B | B |
| Shrub | >3.0 | B | B | B | B | B | B | B | B | B | B |
| Tree | 0-5 | B | B | B | B | B | UN | UN | UN | UN | UN |
| Tree | 5-10 | B | B | B | B | B | UN | UN | UN | UN | UN |
| Tree | 10-25 | B | B | B | B | B | UN | UN | UN | UN | UN |
| Tree | 25-50 | B | B | B | B | B | UN | UN | UN | UN | UN |
| Tree | >50 | B | B | B | B | B | 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 14 Early Development 1 - Open

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| AGLE | Agave lechuguilla | Lechuguilla | Upper |
| FOSP2 | Fouquieria splendens | Ocotillo | Upper |

Description

Annual herbaceous vegetation, bare ground, and rock. Seedling established. Fire does not occur in this class.

*Maximum Tree Size Class*  
No Data

Class B 86 Late Development 1 - Closed

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| AGLE | Agave lechuguilla | Lechuguilla | Mid-Upper |
| FOSP2 | Fouquieria splendens | Ocotillo | Upper |
| OPIM | Opuntia imbricata | Tree cholla | Mid-Upper |
| DASYL | Dasylirion | Sotol | Mid-Upper |

Description

Higher density of succulents. Agave reproducing. High moisture seasons may produce annual herbaceous vegetation. Fire is very unlikely.

*Maximum Tree Size Class*  
No data

Model Parameters

Deterministic Transitions

|  |  |  |  |
| --- | --- | --- | --- |
| **From Class** | **Begins at (yr)** | **Succeeds to** | **After (years)** |
| Early1:OPN | 0 | Late1:CLS | 19 |
| Late1:CLS | 20 | Late1:CLS | 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** |
| Replacement Fire | Late1:CLS | Early1:OPN | 0.0033 | 303 | Yes | 0 |
| Wind or Weather or Stress | Late1:CLS | Early1:OPN | 0.005 | 200 | Yes | 0 |

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