11010

Madrean Oriental Chaparral

BpS Model/Description Version: Aug. 2020

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| --- | --- | --- | --- |
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Vegetation Type

Shrubland

Map Zone

25

Geographic Range

This ecological system’s northern extent occurs in the Guadalupe Mountains in map zone (MZ)25 and extends south to the Davis and Chisos mountains in Trans Pecos.

Biophysical Site Description

It occurs on foothills, mountain slopes, and canyons in drier habitats below the encinal and pine woodlands, and is often associated with more xeric and coarse-texture substrates such as limestone, basalt, or alluvium, especially in transition areas with more mesic woodlands.

Vegetation Description

The moderate to dense shrub canopy includes many shrub oak species such as *Quercus intricata*, *Quercus pringlei*, *Quercus invaginata*, *Quercus laceyi*, *Quercus grisea*, *Quercus emoryi*, *Quercus toumeyi*,and *Q. pungens var. pungens*,and several widespread chaparral species such as *Ceanothus greggii*, *Fallugia paradoxa*,and *Garrya* *wrightii*. Additional species characteristic of this system are *Arbutus arizonica*, *Arbutus xalapensis* (=*Arbutus texana*), *Fraxinus greggii*, *Fendlera rigida* (=*Fendlera linearis*), *Garrya ovata*, and *Rhus virens var. choriophylla* (=*Rhus choriophylla*); and endemics *Salvia lycioides* (=*Salvia ramosissima*), *Salvia roemeriana*, and *Salvia regla*.

BpS Dominant and Indicator Species

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** |
| QUGR3 | *Quercus grisea* | Gray oak |
| QUMO | *Quercus mohriana* | Mohr oak |
| QUIN3 | *Quercus intricata* | Dwarf oak |
| RHVI3 | *Rhus virens* | Evergreen sumac |
| MUSE | *Muhlenbergia setifolia* | Curlyleaf muhly |

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

Disturbance Description

The primary disturbance mechanism is mixed-severity fire resulting in top-kill and rare mortality. Various oak species present respond to fire with vigorous sprouting from the root crown. Larger forms may survive low-intensity surface fire. Extended drought also contributes to disturbance. Most chaparral species are fire adapted, resprouting vigorously after burning or producing fire-resistant seeds. Stands occurring in montane woodlands are seral and a result of recent fires.

Fire Frequency

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Severity** | **Avg FI** | **Percent of All Fires** | **Min FI** | **Max FI** |
| Replacement | 41 | 40 |  |  |
| Moderate (Mixed) |  |  |  |  |
| Low (Surface) | 28 | 60 |  |  |
| All Fires | 16 | 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

Scale ranges from tens to thousands of acres.

Adjacency or Identification Concerns

This biophysical setting (BpS) is characterized by >80% various oak species. This type merges with the mountain shrub BpS at lower elevations and intermingles with the deciduous woodland BpS at higher elevations and/or northern exposures. Co-located with 261127 (Inter-Mountain Basins Semi-Desert Shrub-Steppe) and with montane forests above.

Issues or Problems

Gambel oak community found in very small formation in the Davis Mountains and probably the Guadalupe Range.

Native Uncharacteristic Conditions

Comments

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 | B | B | B | B | B | B | B | B |
| Shrub | 0.5-1.0 | A | A | B | B | B | B | B | B | B | B |
| Shrub | 1.0-3.0 | A | A | C | C | C | C | C | C | C | C |
| Shrub | >3.0 | A | A | 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 10 Early Development 1 - All Structures

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| QUGR3 | Quercus grisea | Gray oak | Upper |
| QULA | Quercus laceyi | Lacey oak | Upper |
| RHVI3 | Rhus virens | Evergreen sumac | Upper |
| MUSE | Muhlenbergia setifolia | Curlyleaf muhly | Upper |

Description

Post-replacement sprouts to approximately 0.5m high. Dense resprouting with high number of stems per acre. Abundant grass and forb cover.

*Maximum Tree Size Class*  
None

Class B 30 Mid Development 1 - Open

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| QUGR3 | Quercus grisea | Gray oak | Upper |
| QULA | Quercus laceyi | Lacey oak | Upper |
| RHVI3 | Rhus virens | Evergreen sumac | Upper |
| MUSE | Muhlenbergia setifolia | Curlyleaf muhly | Upper |

Description

Stem mortality due to competition, with slight decrease in understory species due to shading. Grass and forbs declining.

*Maximum Tree Size Class*  
None

Class C 60 Late Development 1 - Open

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| QUGR3 | Quercus grisea | Gray oak | Upper |
| QULA | Quercus laceyi | Lacey oak | Upper |
| RHVI3 | Rhus virens | Evergreen sumac | Upper |
| MUSE | Muhlenbergia setifolia | Curlyleaf muhly | Upper |

Description

Nearly continuous canopy cover of 2ha+, with only occasional openings (Brown 1958).

*Maximum Tree Size Class*  
None

Model Parameters

Deterministic Transitions

|  |  |  |  |
| --- | --- | --- | --- |
| **From Class** | **Begins at (yr)** | **Succeeds to** | **After (years)** |
| Early1:ALL | 0 | Mid1:OPN | 4 |
| Mid1:OPN | 5 | Late1:OPN | 20 |
| Late1:OPN | 21 | 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** |
| Replacement Fire | Early1:ALL | Early1:ALL | 0.02 | 50 | Yes | 0 |
| Replacement Fire | Mid1:OPN | Early1:ALL | 0.025 | 40 | Yes | 0 |
| Surface Fire | Mid1:OPN | Mid1:OPN | 0.04 | 25 | No | 0 |
| Replacement Fire | Late1:OPN | Early1:ALL | 0.025 | 40 | Yes | 0 |
| Surface Fire | Late1:OPN | Late1:OPN | 0.04 | 25 | No | 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, H.E. 1958. Gambel oak in West-central Colorado. Ecology 39: 317-327.

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

Simonin, K.A. 2000. Quercus gambelli in Fire Effects Information System [Online]. USDA Forest Service, Rocky Mountain Research Station, Forestry Sciences Laboratory (producer). Www.fs.fed.us/database/feis/ [2004, October 28].