11070

Rocky Mountain Gambel Oak-Mixed Montane Shrubland

BpS Model/Description Version: Aug. 2020

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| **Modelers** |  | **Reviewers** |  |
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| None | None | None | None |
| None | None | None | None |

Vegetation Type

Shrubland

Map Zone

13

Geographic Range

Central and southern Rocky Mountains and Colorado Plateau (including Wasatch Range). Most common along the dry foothills and lower mountain slopes. Only in the northeastern edge of map zone 13.

Biophysical Site Description

Variable soil types, but often rocky and potentially erosive, and slopes from gentle to steep on all aspects, but more commonly southern and western slopes. Elevations range from 3,000-8,000ft, typically on mountain foothills and lower slopes. Characterized by Gambel oak covering <60% of the area.

Vegetation Description

Dominated by Gambel oak, often with *Amelanchier* spp, *Artemisia tridentata*, *Prunus virginiana*, *Purshia*, and *Symphoricarpos*. Oak cover is patchy, with patches occupying <60% of the landscape and with grasses/herbs/sagebrush interspaced between oak clones. Oak and most other associated shrubs sprout readily after disturbance.

BpS Dominant and Indicator Species

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** |
| QUGA | *Quercus gambelii* | Gambel oak |
| AMELA | *Amelanchier* | Serviceberry |
| ARTR2 | *Artemisia tridentata* | Big sagebrush |
| PRVI | *Prunus virginiana* | Chokecherry |
| PURSH | *Purshia* | Bitterbrush |
| SYMPH | *Symphoricarpos* | Snowberry |

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

Disturbance Description

Fire is most often mixed, with less frequent replacement severity. Mixed-severity fires resulted in a mosaic pattern of burned and unburned areas. Some areas of the Wasatch Front may have a more frequent replacement fire regime (i.e., 20-50yrs); grasses tend to drive the fire regime.

Insect defoliation occasionally affects Gambel oak, but a single year of defoliation does not cause structural changes. Successive years of frost-kill can cause a transition to early seral. Fire often follows frost-kill disturbance.

Fire Frequency

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Severity** | **Avg FI** | **Percent of All Fires** | **Min FI** | **Max FI** |
| Replacement | 153 | 26 |  |  |
| Moderate (Mixed) | 52 | 74 |  |  |
| Low (Surface) |  |  |  |  |
| All Fires | 39 | 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

This type occurs in relatively large patches across the landscape. Disturbance patch size within the type is generally moderate (a few to hundreds of acres).

Adjacency or Identification Concerns

May be adjacent to Rocky Mountain Bigtooth Maple Ravine Woodland (1012), but oak is generally on drier sites. The two can be distinguished by dominant species; where oak/maple are mixed, it is more likely to be this biophysical setting (1107).

This type is highly susceptible to cheatgrass invasion.

Issues or Problems

There is very little information on fire history for this type.

Native Uncharacteristic Conditions

Canopy cover of oak can reach 100% in patches.

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 | A | A | B | B | B | B | B | B |
| Shrub | 0.5-1.0 | A | A | A | A | B | B | B | B | B | B |
| Shrub | 1.0-3.0 | A | A | A | A | B | B | B | B | B | B |
| Shrub | >3.0 | A | A | A | A | 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 7 Early Development 1 - All Structures

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| QUGA | Quercus gambelii | Gambel oak | Upper |

Description

Grass/forb and young Gambel oak sprouts <2m tall. Within clones, scant herbaceous understory due to oak density. Between clones is fairly high cover of grasses and herbs, and <5% cover of sagebrush and other shrubs.

*Maximum Tree Size Class*  
None

Class B 33 Mid Development 1 - All Structures

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| QUGA | Quercus gambelii | Gambel oak | Upper |
| ARTR2 | Artemisia tridentata | Big sagebrush | Lower |

Description

Gambel oak stems <2-3in in diameter and generally <8ft tall. There is high oak cover (generally >80%) within clones and very sparse herbaceous cover. Interspaces between clones includes grass/herb/sagebrush with 5-20% cover.

*Maximum Tree Size Class*  
None

Class C 60 Late Development 1 - All Structures

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| QUGA | Quercus gambelii | Gambel oak | Upper |
| ARTR2 | Artemisia tridentata | Big sagebrush | Low-Mid |

Description

Closed oak stands characterize the late development stage. Oak stems are generally >2-3in in diameter and usually >8ft tall. Oak cover within the clones is slightly less than in the mid seral due to self-thinning of stems. Herbaceous understory low (although may be somewhat more than in the mid-seral stage). Interspaces between clones is sagebrush (and other low shrubs) with 20-30% cover, and grass/herbs.

Note that Gambel oak may be considered a tree by the time it reaches this class. Height and diameter breaks were not sufficient to distinguish between classes B and C without combining shrub and tree classes. Class C is generally >8 ft tall (2.5m) and >3in (7cm) in diameter.

*Maximum Tree Size Class*  
None

Model Parameters

Deterministic Transitions

|  |  |  |  |
| --- | --- | --- | --- |
| **From Class** | **Begins at (yr)** | **Succeeds to** | **After (years)** |
| Early1:ALL | 0 | Mid1:ALL | 5 |
| Mid1:ALL | 6 | Late1:ALL | 20 |
| Late1:ALL | 21 | Late1: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** |
| Wind or Weather or Stress | Early1:ALL | Early1:ALL | 0.007 | 143 | No | 0 |
| Mixed Fire | Early1:ALL | Early1:ALL | 0.01 | 100 | No | 0 |
| Insects or Disease | Mid1:ALL | Mid1:ALL | 0.003 | 333 | No | 0 |
| Wind or Weather or Stress | Mid1:ALL | Early1:ALL | 0.007 | 143 | Yes | 0 |
| Replacement Fire | Mid1:ALL | Early1:ALL | 0.007 | 143 | Yes | 0 |
| Mixed Fire | Mid1:ALL | Mid1:ALL | 0.02 | 50 | No | 0 |
| Insects or Disease | Late1:ALL | Late1:ALL | 0.003 | 333 | No | 0 |
| Wind or Weather or Stress | Late1:ALL | Early1:ALL | 0.007 | 143 | Yes | 0 |
| Replacement Fire | Late1:ALL | Early1:ALL | 0.007 | 143 | Yes | 0 |
| Mixed Fire | Late1:ALL | Mid1:ALL | 0.02 | 50 | Yes | 0 |

References

Bradley, A.E., N.V. Noste and W.C. Fisher. 1992. Fire Ecology of Forests and Woodlands in Utah. GTR-INT-287. Ogden, UT. U.S. Department of Agriculture, Forest Servi ce, Intermountain Research Station. 128 pp.

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 p.

Harper, K.T., F.J. Waystaff and L.N. Kunxler. 1985. Biology and Management of the Gambel Oak Vegetative Type: A Literature Review. USDA Forest Service Gen. Tech. Report INT-179.

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, November 8].

USDA Forest Service Intermountain Region. 1998. Sub-Regional Assessments of Properly Functioning Condition for Areas Encompassing the National Forests in Northern Utah. Uinta Mountains and Wasatch Mountains sections.

Wright, H.A. and A.W. Bailey. 1982. Fire Ecology, United States and Southern Canada. John Wiley and Sons. 188-194.