

11071

Rocky Mountain Gambel Oak-Mixed Montane Shrubland - Continuous

BpS Model/Description Version: Aug. 2020

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Vegetation Type

Shrubland

Map Zone

16

Model Splits or Lumps

This Biophysical Setting (BpS) is split into multiple models: 11071 is continuous and has >60% Gambel oak cover; 11072 is patchy and has <60% Gambel oak cover. The two also differ by fire regimes: 11071 is dominated by replacement fire; 11072 is dominated by mixed-severity fire. The patchy type (11072) will also occur on drier physical gradients (<5,500ft elevation, south- and west-facing aspect, and shallower soils)

Geographic Range

Central and Southern Rocky Mountains and Colorado Plateau (including Wasatch and Uinta Range). Most common along the dry foothills and lower mountain slopes.

Biophysical Site Description

Variable soil types, but often rocky and potentially erosive, and slopes from gentle to steep, on all aspects. Elevations range from 3,000-8,000ft, typically on mountain foothills and lower slopes. Characterized by Gambel oak clones covering more than 60% of the area. Often found with bigtooth maple (Rocky Mountain Bigtooth Maple Ravine Woodland, 1012).

This type is similar to 11072 but differs in having more continuous (>60% cover) oak stands and more of a replacement-severity fire regime. It will also generally occur on sites over ~5,500ft in elevation, more often on north- or east-facing slopes and on deeper soils than the patchy type (11072). There will, of course, be overlap in the gradients for these two types, however.

Vegetation Description

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

BpS Dominant and Indicator Species

Symbol	Scientific Name	Common Name
QUGA	<i>Quercus gambelii</i>	Gambel oak

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

Disturbance Description

Fire is most often replacement-severity, with less frequent mixed-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) where grasses tend to drive the fire regime.

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

Fire Frequency

Severity	Avg FI	Percent of All Fires	Min FI	Max FI
Replacement	57	74		
Moderate (Mixed)	163	26		
Low (Surface)				
All Fires	42	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 is generally moderately large (10s to a few 100s 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, and where oak/maple are mixed it is more likely to be this BpS (1107).

Patchy types of Rocky Mountain Gambel Oak -- Mixed Montane Shrubland (11072) will be similar but will have Gambel oak patches occupying <60% of the landscape and will generally occur at lower elevations (<5,500ft), drier aspects (south- and west-facing), and in shallower soils than the continuous type (11071).

Issues or Problems

Both Gambel oak models (11071 and 11072) were particularly difficult to define because the amount of Gambel oak compared to grasses dictates the fire regime (i.e., the more Gambel oak/less grass, the higher severity the fire regime). However, oak clones are spatially stable and grassy interspaces are edaphically controlled, so vegetation doesn't easily transition from grass to oak or vice versa. These types are not shifting mosaics. Thus, there is no class in this model that is defined as primarily grasses. The class descriptions between the two models are identical, even though the continuous type (11071) has greater oak coverage overall than the patchy type (11072). To identify which BpS is on the ground, the percent of Gambel oak cover should be summarized over a landscape scale.

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

For stems >50yrs old in fire-safe areas, oak may take tree form in the southern portion of map zone (MZ) 16.

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	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	B	B	B	B	B	B	C	C	C	C
Tree	0-5	C	C	C	C	C	C	C	C	C	C
Tree	5-10	C	C	C	C	C	C	C	C	C	C
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 12 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, little 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 34 Mid Development 1 - All Structures

Indicator Species

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

Description

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

Maximum Tree Size Class

Seedling <4.5ft

Class C	54	Late Development 1 - All Structures
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Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
QUGA	Quercus gambelii	Gambel oak	None

Description

Late-seral is >20yrs in age, generally in closed stands. Gambel oak may be considered a tree by the time it reaches this class. Oak stems are generally >2-3in diameter and usually >8ft tall. Oak cover within the clones is slightly lower 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 are sagebrush (and other low shrubs) with 20-30% cover and grass/herbs. For stems >50yrs old in fire-safe areas, trees may be present in the southern portion of MZ16.

Maximum Tree Size Class

Sapling >4.5ft; <5" DBH

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
Insects or Disease	Mid1:ALL	Mid1:ALL	0.003	333	No	0
Mixed Fire	Mid1:ALL	Mid1:ALL	0.007	143	No	0

Wind or Weather or Stress	Mid1:ALL	Early1:ALL	0.007	143	Yes	0
Replacement Fire	Mid1:ALL	Early1:ALL	0.02	50	Yes	0
Insects or Disease	Late1:ALL	Late1:ALL	0.003	333	No	0
Mixed Fire	Late1:ALL	Mid1:ALL	0.007	143	Yes	0
Wind or Weather or Stress	Late1:ALL	Early1:ALL	0.007	143	Yes	0
Replacement Fire	Late1:ALL	Early1:ALL	0.02	50	Yes	0

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