

11070

Rocky Mountain Gambel Oak-Mixed Montane Shrubland

BpS Model/Description Version: Aug. 2020

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Vegetation Type

Shrubland

Map Zones

23, 24

Geographic Range

Gambel oak occurs primarily in CO, NM, UT, AZ and southeastern WY. In the southern extent of its distribution, Gambel oak occupies a minor role as an associate with ponderosa pine and mixed conifer habitats. Moving north, long-lived Gambel oak clones form dominant to monotypic overstories (Simonin 2000).

Biophysical Site Description

In CO, Gambel oak occurs between 6000-9000ft on all aspects. At higher elevations it is more predominant on southern exposures. Gambel oak is typically a riparian species in northern NM, occurring from 6580-8080ft within the Black and Sacramento Mountain ranges. In southern NM, Gambel oak is found on south-facing montane aspects. AZ Gambel oak occurs as a shrub thicket or as a tree throughout the ponderosa pine habitat at elevations ranging from 8000-8600ft. In UT, Gambel oak is a dominant species in the central UT mountain brush zone at 6500-7800ft on southern exposures. On northern exposures Gambel oak shares dominance with bigtooth maple or is completely replaced by bigtooth maple. (Simonin 2000).

Vegetation Description

Gambel oak occurs as the dominant species ranging from dense thickets to clumps associated with serviceberry or sagebrush. Gambel oak generally has a well-developed understory comprised of snowberry, elk sedge, letterman's needlegrass, poa ampla, yarrow, lupine and goldenrod.

BpS Dominant and Indicator Species

Symbol	Scientific Name	Common Name
QUGA	<i>Quercus gambelii</i>	Gambel oak
AMUT	<i>Amelanchier utahensis</i>	Utah serviceberry
CAGE2	<i>Carex geyeri</i>	Geyer's sedge
STLE4		

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

Disturbance Description

Fire regime group IV or III. The primary disturbance mechanism is replacement fire, resulting in >75% top-kill. Gambel oak responds to fire with vigorous sprouting from the root crown. Larger forms may survive low intensity surface fire. Extended drought also contributes to disturbance.

Fire Frequency

Severity	Avg FI	Percent of All Fires	Min FI	Max FI
Replacement	52	74		
Moderate (Mixed)	153	26		
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

Scale ranges from 10 to 1000s of acres

Adjacency or Identification Concerns

This BpS is characterized by >80% Gambel oak. This type merges with the mountain shrub communities at lower elevations and intermingles with deciduous woodland BpS at higher elevations and/or northern exposures.

Issues or Problems

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	A	A	A	A	A	A
Shrub	0.5-1.0	A	A	B	B	B	B	B	B	B	B
Shrub	1.0-3.0	A	A	B	B	B	B	B	D	D	D
Shrub	>3.0	A	A	B	B	B	C	C	D	D	D
Tree	0-5	D	D	D	D	D	UN	UN	UN	UN	UN
Tree	5-10	D	D	D	D	D	UN	UN	UN	UN	UN
Tree	10-25	D	D	D	D	D	UN	UN	UN	UN	UN
Tree	25-50	D	D	D	D	D	UN	UN	UN	UN	UN
Tree	>50	D	D	D	D	D	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	8	Early Development 1 - All Structures
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Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
CAGE2	Carex geyeri	Geyer's sedge	Lower
STLE4	Stipa lettermanii Vasey	Letterman's needlegrass	Lower
QUGA	Quercus gambelii	Gambel oak	Upper
SYOR2	Symphoricarpos oreophilus	Mountain snowberry	Upper

Description

Post-replacement sprouts to approximately 2ft high. Dense resprouting with high number of stems/acre. Abundant grass and forb cover.

Upper Layer Lifeform is not the dominant lifeform. Grasses may dominate for the early part of this class. Sprouting shrubs will recover relatively quickly.

Maximum Tree Size Class

None

Class B	46	Mid Development 1 - Closed
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Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
QUGA	Quercus gambelii	Gambel oak	Upper
CAGE2	Carex geyeri	Geyer's sedge	Lower
STLE4	Stipa lettermanii Vasey	Letterman's needlegrass	Lower

Description

Oak 3-6ft tall to 3in dbh. There will be some stem mortality due to competition and self-thinning, with slight decrease in understory species due to shading. Grass and forbs declining.

Maximum Tree Size Class

None

Class C	13	Late Development 2 - Open
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Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
QUGA	Quercus gambelii	Gambel oak	Upper
ARTRV	Artemisia tridentata ssp. vaseyana	Mountain big sagebrush	Middle
CAGE2	Carex geyeri	Geyer's sedge	Lower

Description

Greater than six feet tall and less than three inches DBH. Small stands <30m across usually scattered throughout a grassland or shrub type (Brown 1958).

Maximum Tree Size Class

None

Class D 33 Late Development 1 - Closed

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
QUGA	Quercus gambelii	Gambel oak	Upper
CAGE2	Carex geyeri	Geyer's sedge	Lower
STLE4	Stipa lettermanii Vasey	Letterman's needlegrass	Lower
ACAG	Achillea ageratifolia	Yarrow	Lower

Description

Greater than six feet tall and three inches DBH. Nearly continuous stand two or more hectares in size 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:CLS	4
Mid1:CLS	5	Late1:CLS	44
Late2:OPN	45	Late1:CLS	69
Late1:CLS	46	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	Early1:ALL	Early1:ALL	0.02	50	Yes	0
Replacement Fire	Mid1:CLS	Early1:ALL	0.025	40	Yes	0
Replacement Fire	Late1:CLS	Early1:ALL	0.013	77	Yes	0
Mixed Fire	Late1:CLS	Late2:OPN	0.02	50	Yes	0
Replacement Fire	Late2:OPN	Early1:ALL	0.017	59	Yes	0

References

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].