

11150

Inter-Mountain Basins Juniper Savanna

BpS Model/Description Version: Aug. 2020

Modelers		Reviewers	
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None	None	None	None
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Vegetation Type

Steppe/Savanna

Map Zones

15, 16, 23, 24

Geographic Range

This widespread ecological system occupies dry foothills and sandsheets of western Colorado, northwestern New Mexico, northern Arizona, Utah, west into the Great Basin of Nevada, and southern Idaho.

Biophysical Site Description

This ecological system is typically found at lower elevations, ranging from 1,500-2,300m. Occurrences are found on lower mountain slopes, hills, plateaus, basins, and flats, often where juniper is expanding into semi-desert grasslands and steppe.

Vegetation Description

The vegetation is typically open savanna, although there may be inclusions of more dense juniper woodlands. This savanna is typically dominated by *Juniperus osteosperma* trees with high cover of perennial bunch grasses and forbs, with *Bouteloua gracilis*, *Hesperostipa comata*, and *Pleuraphis jamesii* being most common. In the southern Colorado Plateau, *Juniperus monosperma* or juniper hybrids may dominate the tree layer. Pinyon trees are typically not present because sites are outside the ecological or geographic range of *Pinus edulis* and *Pinus monophylla*.

BpS Dominant and Indicator Species

Symbol	Scientific Name	Common Name
JUOS	<i>Juniperus osteosperma</i>	Utah juniper
JUOC	<i>Juniperus occidentalis</i>	Western juniper
BOGR2	<i>Bouteloua gracilis</i>	Blue grama

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

Disturbance Description

Uncertainty exists about the fire frequencies of this ecological system, though it is predominantly Fire Regime Group III. Fire regime was primarily determined by fire occurrence in the surrounding matrix vegetation. Lightning-ignited fires were common but typically did not affect more than a few individual trees. Replacement fires were uncommon to rare (average fire return interval [FRI] of 100-500yrs) and occurred primarily during extreme fire behavior conditions. Mixed-severity fire (average FRI of 100-500yrs) was characterized as a mosaic of replacement

and surface fires distributed through the patch at a fine scale (<0.1ac). Surface fires could occur in stands where understory grass (FEID) cover is high and provides adequate fuel. Surface fires were primarily responsible for producing fire scars on juniper or pinyon trees (average FRI of 100yrs).

Fire Frequency

Severity	Avg FI	Percent of All Fires	Min FI	Max FI
Replacement	329	19	100	1000
Moderate (Mixed)	216	29	100	1000
Low (Surface)	124	52		
All Fires	64	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

Juniper steppe was usually distributed across the landscape in patches that range from 10s to 100s of acres in size. In areas with very broken topography and/or mesa landforms, this type may have occurred in patches of several hundred acres. In Utah and Nevada, pinyon and juniper landscape patches tended to be 10-100s of acres in size.

Adjacency or Identification Concerns

This system is generally found at lower elevations and more xeric sites than Great Basin Pinyon-Juniper Woodland (1019) or Colorado Plateau Pinyon-Juniper Woodland (1016). It is also ecologically similar to (and the model is similar to) Colorado Plateau Pinyon-Juniper Shrubland (1102).

Fire regime primarily determined by adjacent vegetation and spread from the adjacent types into this community.

In modern days, surrounding matrix vegetation has changed to young to mid-aged woodlands that burn more intensely than the former sagebrush matrix. Many lay people confuse these younger pinyon and juniper woodlands with true woodlands dependent on naturally fire-protected features.

Issues or Problems

Native Uncharacteristic Conditions

Comments

Map zones (MZs) 15, 16, 23, and 24 were combined during 2015 BpS Review because the comments and LANDFIRE review indicated that the models were duplicate with only one minor differences in the s-class mapping rules -- MZ15 Class B minimum height was .6m, and in all other MZs it was 0m.

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	B	B	B	B	B	B	B	B	B
Herb	0.5-1.0	A	B	B	B	B	B	B	B	B	B
Herb	>1.0	A	B	B	B	B	B	B	B	B	B
Shrub	0-0.5	B	C	C	C	UN	UN	UN	UN	UN	UN
Shrub	0.5-1.0	B	C	C	C	UN	UN	UN	UN	UN	UN
Shrub	1.0-3.0	B	C	C	C	UN	UN	UN	UN	UN	UN
Shrub	>3.0	B	C	C	C	UN	UN	UN	UN	UN	UN
Tree	0-5	C	C	D	E	UN	UN	UN	UN	UN	UN
Tree	5-10	C	C	D	E	UN	UN	UN	UN	UN	UN
Tree	10-25	C	C	D	E	UN	UN	UN	UN	UN	UN
Tree	25-50	C	C	D	E	UN	UN	UN	UN	UN	UN
Tree	>50	C	C	D	E	UN	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	3	Early Development 1 - Open
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Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
BOGR2	Bouteloua gracilis	Blue grama	Upper
HECO26	Hesperostipa comata	Needle and thread	Upper
CRYPT	Cryptantha	Cryptantha	Lower
PLEUR12	Pleuraphis	Galleta grass	Upper

Description

Initial post-fire community dominated by annual forbs. Later stages of this class contain greater amounts of perennial grasses and forbs. Replacement fire occurs. Infrequent mixed-severity fire thins vegetation.

Maximum Tree Size Class

None

Class B	5	Mid Development 1 - Open
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Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
BOGR2	<i>Bouteloua gracilis</i>	Blue grama	Upper
HECO26	<i>Hesperostipa comata</i>	Needle and thread	Upper

ARTRV	<i>Artemisia tridentata</i> ssp. <i>vaseyana</i>	Mountain big sagebrush	Upper
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Description

Dominated by perennial forbs and grasses. Total cover remains low due to shallow, unproductive soil. It is important to note that replacement fire at this stage does not eliminate perennial grasses. Mixed-severity fire thins the woody vegetation.

Maximum Tree Size Class

None

Class C	13	Mid Development 2 - Open
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Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
ARTRV	Artemisia tridentata ssp. vaseyana	Mountain big sagebrush	Upper
BOGR2	Bouteloua gracilis	Blue grama	Middle
JUOC	Juniperus occidentalis	Western juniper	Mid-Upper
JUOS	Juniperus osteosperma	Utah juniper	Mid-Upper

Description

Shrub-dominated community with young juniper seedlings becoming established. It is important to note that replacement fire at this stage does not eliminate perennial grasses. Mixed-severity fire.

Maximum Tree Size Class

Seedling <4.5ft

Class D	36	Late Development 1 - Open
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Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
JUOC	<i>Juniperus occidentalis</i>	Western juniper	Upper
BOGR2	<i>Bouteloua gracilis</i>	Blue grama	Lower
ARTRV	<i>Artemisia tridentata</i> ssp. <i>vaseyana</i>	Mountain big sagebrush	Middle
JUOS	<i>Juniperus osteosperma</i>	Utah juniper	Upper

Description

Community dominated by young juniper and pine of mixed age structure. Juniper and pinyon becoming competitive on site and beginning to affect understory composition. Mixed-severity fire is less frequent than in previous states, whereas surface fire becomes more important at this age in succession.

Maximum Tree Size Class

Pole 5-9" DBH

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
JUOC	Juniperus occidentalis	Western juniper	Upper
BOGR2	Bouteloua gracilis	Blue grama	Lower
JUOS	Juniperus osteosperma	Utah juniper	Upper

Description

Site dominated by widely spaced old juniper. Grasses (e.g., *Bouteloua gracilis*, *Hesperostipa comata*) present on microsites sites with deeper soils (>20in) with restricting clay subsurface horizon. Potential maximum overstory coverage is greater in those stands with pinyon as compared to those with only juniper. Replacement fire and mixed-severity fires are rare. Surface fire will scar ancient trees.

Maximum Tree Size Class

Medium 9-21" DBH

Model Parameters**Deterministic Transitions**

From Class	Begins at (yr)	Succeeds to	After (years)
Early1:OPN	0	Mid1:OPN	9
Mid1:OPN	10	Mid2:OPN	29
Mid2:OPN	30	Late1:OPN	99
Late1:OPN	100	Late2:OPN	399
Late2:OPN	400	Late2: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
Mixed Fire	Early1:OPN	Early1:OPN	0.003	333	No	0
Replacement Fire	Early1:OPN	Early1:OPN	0.01	100	Yes	0
Mixed Fire	Mid1:OPN	Mid1:OPN	0.01	100	No	0
Replacement Fire	Mid1:OPN	Early1:OPN	0.01	100	Yes	0
Replacement Fire	Mid2:OPN	Early1:OPN	0.005	200	Yes	0
Mixed Fire	Mid2:OPN	Mid2:OPN	0.01	100	No	0
Replacement Fire	Late1:OPN	Early1:OPN	0.002	500	Yes	0
Mixed Fire	Late1:OPN	Late1:OPN	0.005	200	No	0
Surface Fire	Late1:OPN	Late1:OPN	0.01	100	No	0
Mixed Fire	Late2:OPN	Late2:OPN	0.002	500	No	0
Replacement Fire	Late2:OPN	Early1:OPN	0.002	500	Yes	0
Surface Fire	Late2:OPN	Late2:OPN	0.01	100	No	0

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