

11150

Inter-Mountain Basins Juniper Savanna

BpS Model/Description Version: Aug. 2020

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Vegetation Type

Steppe/Savanna

Map Zones

21, 22

Geographic Range

This system is thought not to occur in map zone (MZ) 21. This widespread ecological system occupies dry foothills and sandsheets of western Colorado, northwestern New Mexico, northern Arizona and Utah, and 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.

12-14in precipitation zone and above.

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 (*Koeleria macrantha*, *Heterostipa comata*, *Pseudoroegneria spicata*, *Poa secunda*, and *Elymus elemoides* that make a bunchgrass understory.) These may vary in abundance in different classes but remain present. Sagebrush comes in, and grass cover is reduced. *Festuca idahoensis* may be present on more mesic sites.

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. Fire regime primarily determined by adjacent vegetation and spread from the adjacent types into this community. 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 trees (average FRI of 100yrs).

FRIs vary between this 1115 system and BpS 1049 Limber Pine-Juniper Woodland. The Inter-Mountain Basins Juniper Savanna has a different moisture regime than the Foothill Limber Pine-Juniper Woodland -- the moisture tends to come at a different time of year. In the Foothill Limber Pine-Juniper Woodland that occurs on the Medicine Bow-Routt National Forests, we can get extensive fog at any time of the year, which leads to extensive white pine blister rust in the limber pine but also would influence the moisture content of fine fuel and subsequently the fire regime. There also tend to be more shrubs in the Limber Pine-Juniper Woodland than the Inter-Mountain Basins Juniper Savanna.

Fire Frequency

Severity	Avg FI	Percent of All Fires	Min FI	Max FI
Replacement	356	18	100	1000
Moderate (Mixed)	213	30	100	1000
Low (Surface)	124	52	100	200
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-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.

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).

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.

Presence of cheatgrass can increase the fire frequency.

It was discussed among MZ22 reviewers as to whether or not this BpS truly occurs historically or if it is a seral component of BpS 1049. It is thought that this system, 1115, in late-seral condition, would develop toward a denser stand. Original models feel that Juniper Savanna is indeed a system within this MZ and that it should not be combined with the Limber Pine-Juniper

Woodland. More juniper savanna would occur in the southwestern portion of this MZ and more limber pine juniper type in the eastern and northern portions of this MZ.

Issues or Problems

We have low degree of certainty on the percentages of canopy closure for the classes. Cheatgrass invasion may result in high cover measurements.

Native Uncharacteristic Conditions

Comments

MZs 21 and 22 were combined during 2015 BpS Review.

This model for MZ21 was adopted as is from the same BpS from MZ22. Since this type is thought not to occur in MZ21, it received no review for MZ 21.

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	B	B	B	B	UN	UN	UN	UN	UN	UN
Shrub	0.5-1.0	B	B	B	B	UN	UN	UN	UN	UN	UN
Shrub	1.0-3.0	B	B	B	B	UN	UN	UN	UN	UN	UN
Shrub	>3.0	B	B	B	B	UN	UN	UN	UN	UN	UN
Tree	0-5	B	B	B	B	UN	UN	UN	UN	UN	UN
Tree	5-10	C	C	D	D	UN	UN	UN	UN	UN	UN
Tree	10-25	C	C	D	D	UN	UN	UN	UN	UN	UN
Tree	25-50	C	C	D	D	UN	UN	UN	UN	UN	UN
Tree	>50	C	C	D	D	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	6	Early Development 1 - Open
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Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
PSSP6	Pseudoroegneria spicata	Bluebunch wheatgrass	Upper
KOMA	Koeleria macrantha	Prairie junegrass	Upper

POSE	Poa secunda	Sandberg bluegrass	Upper
JUOS	Juniperus osteosperma	Utah juniper	Upper

Description

Dominated by perennial forbs and grasses. Total cover remains low due to shallow, unproductive soil. Mixed-severity fire thins the tree seedlings. Juniperus osteosperma may have 0-10% cover and be up to 2m tall.

Maximum Tree Size Class

None

Class B 13 Mid Development 1 - Open

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
ARTRW8	Artemisia tridentata ssp. wyomingensis	Wyoming big sagebrush	Middle
ARAR8	Artemisia arbuscula	Little sagebrush	Middle
PSSP6	Pseudoroegneria spicata	Bluebunch wheatgrass	Lower
JUOS	Juniperus osteosperma	Utah juniper	Upper

Description

Shrub-dominated community with young juniper seedlings becoming established. Mixed-severity fire.

Maximum Tree Size Class

Pole 5-9" DBH

Class C 36 Mid Development 2 - Open

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
JUOS	Juniperus osteosperma	Utah juniper	Upper
ARAR8	Artemisia arbuscula	Little sagebrush	Middle
ARTRW8	Artemisia tridentata ssp. wyomingensis	Wyoming big sagebrush	Middle
PSSP6	Pseudoroegneria spicata	Bluebunch wheatgrass	Lower

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

Class D	45	Late Development 1 - Open
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Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
JUOS	Juniperus osteosperma	Utah juniper	Upper
PSSP6	Pseudoroegneria spicata	Bluebunch wheatgrass	Upper
ELEL5	Elymus elymoides	Squirreltail	Lower
HECO26	Hesperostipa comata	Needle and thread	Lower

Description

Site dominated by widely spaced old juniper. Grasses (e.g., *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	20
Mid1:OPN	21	Mid2:OPN	90
Mid2:OPN	91	Late1:OPN	391
Late1:OPN	392	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:OPN	Early1:OPN	0.01	100	Yes	0
Mixed Fire	Early1:OPN	Early1:OPN	0.013	77	No	0
Replacement Fire	Mid1:OPN	Early1:OPN	0.005	200	Yes	0
Mixed Fire	Mid1:OPN	Mid1:OPN	0.01	100	No	0
Replacement Fire	Mid2:OPN	Early1:OPN	0.002	500	Yes	0
Mixed Fire	Mid2:OPN	Mid2:OPN	0.005	200	No	0
Surface Fire	Mid2:OPN	Mid2:OPN	0.01	100	No	0
Mixed Fire	Late1:OPN	Late1:OPN	0.002	500	No	0
Replacement Fire	Late1:OPN	Early1:OPN	0.002	500	Yes	0
Surface Fire	Late1:OPN	Late1:OPN	0.01	100	No	0

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