

11020

Colorado Plateau Pinyon-Juniper Shrubland

BpS Model/Description Version: Aug. 2020

Modelers		Reviewers	
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None	None	None	None
None	None	None	None

Vegetation Type

Shrubland

Map Zones

13, 15, 16, 23, 24

Geographic Range

This ecological system is characteristic of the rocky mesa tops and slopes on the Colorado Plateau and western slope of Colorado.

Biophysical Site Description

Substrates are shallow/rocky and shaley soils at lower elevations (1,200-2,000m). These stunted tree shrublands may extend farther upslope along the low-elevation margins of taller pinyon-juniper woodlands.

Vegetation Description

The vegetation is dominated by dwarfed (usually <3m tall) *Pinus edulis* and/or *Juniperus osteosperma* trees forming extensive tall shrublands in the region along low-elevation margins of pinyon-juniper woodlands. Other shrubs, if present, may include *Artemisia nova*, *Artemisia tridentata* ssp. *wyomingensis*, *Chrysothamnus viscidiflorus*, or *Coleogyne ramosissima*. Herbaceous layers are sparse to moderately dense and typically composed of xeric graminoids.

BpS Dominant and Indicator Species

Symbol	Scientific Name	Common Name
PIED	<i>Pinus edulis</i>	Twoneedle pinyon
JUOS	<i>Juniperus osteosperma</i>	Utah juniper
ARTR2	<i>Artemisia tridentata</i>	Big sagebrush

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

Disturbance Description

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 fire was uncommon to rare (average fire return interval [FRI], 100-500yrs) and occurred primarily during extreme fire behavior conditions. Mixed-severity fire (average FRI, 100-500yrs) was characterized as a mosaic of replacement and surface fires distributed through the patch at a fine scale (<0.1ac). Surface fire could occur in stands where understory grass cover was high and provided adequate fuel. Surface fire was primarily responsible for producing fire scars on juniper or pinyon trees (average FRI, 100yrs).

Fire Frequency

Severity	Avg FI	Percent of All Fires	Min FI	Max FI
Replacement	336	19	100	1000
Moderate (Mixed)	223	29	100	1000
Low (Surface)	128	52	100	100
All Fires	65	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/pinyon-juniper shrubland was usually distributed across the landscape in patches that range from tens to hundreds of acres. 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 tens to hundreds of acres.

Adjacency or Identification Concerns

Sites are drier than Colorado Plateau Pinyon-Juniper Woodland (1016).

These stunted tree shrublands may extend farther upslope along the low-elevation margins of taller pinyon-juniper woodlands.

Issues or Problems

Information was scarce on this ecological system. It appears that this model is a hybrid between the Colorado Plateau Pinyon-Juniper Woodland (1016) and Inter-Mountain Basins Juniper Savanna (1115). Due to the shallow/rocky soils of mesa tops, the Inter-Mountain Basins Juniper Savanna model for map zone 16 (161115) is very similar.

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	B	B	B	B	B	B	B	B	B	B
Shrub	0.5-1.0	B	B	B	B	B	B	B	B	B	B
Shrub	1.0-3.0	B	B	B	B	B	B	B	B	B	B
Shrub	>3.0	B	B	B	B	B	B	B	B	B	B
Tree	0-5	C	C	D	E	E	E	E	E	E	E
Tree	5-10	C	C	D	E	E	E	E	E	E	E
Tree	10-25	C	C	D	E	E	E	E	E	E	E

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

References

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