

11450

Rocky Mountain Subalpine-Montane Mesic Meadow

BpS Model/Description Version: Aug. 2020

Modelers		Reviewers	
Jan Nachlinger	jnachlinger@tnc.org	None	None
None	None	None	None
None	None	None	None

Reviewer: Kori Blankenship

Vegetation Type

Herbaceous

Map Zone

13

Geographic Range

Found in the Rocky Mountains, Great Basin, and Mojave Desert on high elevation ranges. Found only on the highest ranges of map zone (MZ) 13, which is mainly the Spring Mountains and Inyo Mountains. Infrequent Biophysical Setting (BpS) in MZ13.

Biophysical Site Description

This BpS is restricted to sites in the sub-alpine zone where fine-texture soils, snow deposition, or wind-swept dry conditions limit tree establishment. Typically above 3,000m (9,800ft) in elevation in the southern part of its range, such as MZ13. The soils are typically cryic, and seasonally moist to saturated in the spring, but dry out later in the growing season. These upland communities occur on gentle to moderate-gradient slopes.

Vegetation Description

BpS 1145 is grass dominated in the Mojave Desert, which is different from the forb-dominated types in the Great Basin. Important taxa include *Acnatherum lettermanii*, *A. columbianum*, *Bromus carinatus*, *Deschampia caespitosa*, *Elymus trachycaulus*, *E. elymoides*, *Agastache urticifolia*, *Arabis pendulina*, *Antennaria microphylla*, *Chamerion angustifolium*, *Cirsium clokeyi*, *Erigeron clokeyi*, *Senecio* spp., *Mertensia* spp., *Penstemon leiophyllus*, *Hackelia* spp., *Hymenoxys lemmonii*, *Linum lewisii*, *Lupinus argentatus*, *Solidago* spp., *Ligusticum* spp., *Osmorhiza* spp., *Thalictrum* spp., *Valeriana* spp., and *Silene verecunda*. Burrowing mammals can increase forb diversity.

BpS Dominant and Indicator Species

Symbol	Scientific Name	Common Name
BRCA5	<i>Bromus carinatus</i>	California brome
ACLE	<i>Acer leucoderme</i>	Chalk maple
DECA	<i>Delphinium californicum</i>	California larkspur
AGUR	<i>Agastache urticifolia</i>	Nettleleaf giant hyssop
LUPIN	<i>Lupinus</i>	Lupine
OSMOR	<i>Osmorhiza</i>	Sweetroot

THALI	<i>Thalia</i>	Alligator-flag
ERIGE	<i>Erigenia</i>	Erigenia

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

Disturbance Description

Fires are primarily replacement. Mixed-severity fire occurs in late-development meadows and removes shrubs. The ignition source in this type is probably associated with Native American ignitions in the fall and spring, but fire spreads from adjacent shrub- or tree-dominated sites, such as mountain big sagebrush and upper montane and sub-alpine conifers.

Fire Frequency

Severity	Avg FI	Percent of All Fires	Min FI	Max FI
Replacement	40	80		
Moderate (Mixed)	159	20		
Low (Surface)				
All Fires	32	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 ranges in size from <10-100ac. In MZ13, the Spring Mountains are high enough to support this BpS. Experts estimate patches to be very small (<10ac).

Adjacency or Identification Concerns

BpS 1145 is graminoid dominated in the Mojave Desert and resembles very closely BpS 1146. The tall forbs community represented by 1145 does not exist in the Mojave Desert as it does in MZ12, MZ16, and MZ17. Forbs are much less common than graminoids in MZ13.

Often adjacent to mountain big sagebrush (BpS 1126) and bristlecone/limber pine (BpS 1020).

Bromus tectorum (cheatgrass) is present in minor amounts at higher elevations.

Issues or Problems

No data or literature on this system in MZ13.

Native Uncharacteristic Conditions

Herbaceous cover can reach 100%, whereas woody shrub cover >20% is considered uncharacteristic.

Comments

Kori Blankenship reviewed the use of mixed-severity fire in this model during the 2017 BpS review to determine whether its use was consistent with LANDFIRE's definition of the term. LANDFIRE defines a fire that top-kills 25-75% of the upper layer lifeform as mixed severity. In this model, mixed fire is used to transition from Late 1 Open to Mid 1 Open. Although fire would probably kill or top-kill the shrubs in this BpS (according to Fire Effects Information System species reviews), comments about MZ13 and MZ16 note that fires probably burned in the fall and spring, when the dominant forbs are dead and cured, and therefore not affected by fire. The MZ09/10/19 model variant also mentions the possible presence of trees in the Late 1 Open class. In these circumstances, mixed fire seemed to be appropriate, and Blankenship decided to leave the model unchanged.

This BpS is very different in the Mojave Desert than in the Great Basin, with a high dominance by grass rather than forbs. The system is also infrequent to rare in MZ13.

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

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
ACLE	<i>Acer leucoderme</i>	Chalk maple	Upper
BRCA5	<i>Bromus carinatus</i>	California brome	Upper
AGUR	<i>Agastache urticifolia</i>	Nettleleaf giant hyssop	Upper
ASTER	<i>Aster</i>	Aster	Upper

Description

Vegetation is typically graminoid-rich, with forbs contributing some herbaceous cover. Important taxa include *Acnatherum lettermanii*, *A. columbianum*, *Bromus carinatus*, *Deschampia caespitosa*, *Elymus trachycaulus*, *E. elymoides*, *Agastache urticifolia*, *Arabis pendulina*, *Antennaria microphylla*, *Chamerion angustifolium*, *Cirsium clokeyi*, *Erigeron clokeyi*, *Senecio* spp., *Mertensia* spp., *Penstemon leiophyllus*, *Hackelia* spp., *Hymenoxys*

Maximum Tree Size Class
None

Indicator Species

Description

Maximum Tree Size Class
None

Indicator Species

Description

Vegetation is typically forb-rich, with graminoids contributing more to overall herbaceous cover than forbs. Important taxa include *Acnatherum lettermanii*, *A. columbianum*, *Bromus carinatus*, *Deschampia caespitosa*, *Elymus trachycaulus*, *E. elymoides*, *Agastache urticifolia*, *Arabis pendulina*, *Antennaria microphylla*, *Chamerion angustifolium*, *Cirsium clokeyi*, *Erigeron clokeyi*, *Senecio* spp., *Mertensia* spp., *Penstemon leiophyllus*, *Hackelia* spp., *Hymenoxys*

lemmonii, *Linum lewisii*, *Lupinus argentatus*, *Solidago* spp., *Ligusticum* spp., *Osmorhiza* spp., *Thalictrum* spp., *Valeriana* spp., and *Silene verecunda*.

Five percent to 10% of cover in this class may be woody species from adjacent plant communities such as *Populus tremuloides*, *Artemisia tridentata*, *Rosa woodsii*, *Ribes* spp., and *Amelanchier* spp. Mixed-severity fire removes shrubs from the overstory.

Maximum Tree Size Class

Seedling <4.5ft

Model Parameters

Deterministic Transitions

From Class	Begins at (yr)	Succeeds to	After (years)
Early1:OPN	0	Mid1:CLS	2
Mid1:CLS	3	Late1:OPN	22
Late1:OPN	23	Late1:OPN	522

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	0.025	40	Yes	0
Replacement Fire	Mid1:CLS	Early1:OPN	0.025	40	Yes	0
Mixed Fire	Late1:OPN	Mid1:CLS	0.0133	75	Yes	0
Replacement Fire	Late1:OPN	Early1:OPN	0.025	40	Yes	0

References

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