

10810

Inter-Mountain Basins Mixed Salt Desert Scrub

BpS Model/Description Version: Aug. 2020

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Modelers		Reviewers	
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None	None	None	None
None	None	None	None

Reviewer: Andrea Laliberte, Alan Sands

Vegetation Type

Shrubland

Map Zones

7, 8, 9

Geographic Range

This type occurs on the fringes of dry lakebeds and playas in southeastern Oregon and northern Nevada.

Biophysical Site Description

This type occurs in valley bottoms around Pleistocene lake beds and playas. Soils are often alkaline usually with low permeability. Lakes fill to varying levels in winter and spring. Many soils are derived from alluvium.

Average annual precipitation ranges from 5-10in. Summers are hot, dry and windy. Spring is the only dependable growing season with moisture both from winter and spring precipitation. Cool springs can delay the onset of plant growth and drought can curtail the length of active spring growth. Freezing temperatures are common from November through April.

Vegetation Description

This biophysical setting (BpS) includes low (<3ft) and medium-sized shrubs found widely scattered (often 20-30ft apart) to high density (3-4 plants per sq. m) shrubs interspersed with low to mid-height bunchgrasses. Common shrubs are greasewood, shadscale, winterfat, fourwing saltbush, sickle saltbush, Nevada ephedra, horsebrush, low rabbitbrush, broom snakeweed, saltbush and spiny hopsage. Common bunchgrass species are Indian ricegrass, needle-and-thread, purple three-awn and bottlebrush squirreltail. Globemallows are the most common and widespread forbs.

Greasewood communities typically occur on alkaline soils with perched or near the surface water tables and have a closed canopy aspect. The understory grasses and forbs are salt-tolerant, not particularly drought tolerant and are variably abundant. The relative abundance of species may vary in a patchwork pattern across the landscape in relation to subtle differences in soils and reflect variation in disturbance history. Total cover rarely exceeds 25% and annual production is closely linked to winter-spring precipitation. Stand replacing disturbances (insects, flooding and drought) tended to cause a return to the grass dominated condition or to short lived forb/grass

communities. Early successional communities dominated by shrubs that resprouted (eg, black greasewood) also existed. The primary successional path was from grass dominant to shrub dominant, however alternative trajectories among the three different early successional classes depended on the existing composition at the time of disturbance, and weather conditions during the next growing season(s).

LANDFIRE National reviewers added that basin wildrye (*Leymus cinereus*) can occur in this type, occasionally as large patches (10-100ac.), if salinity or alkalinity is not too severe.

BpS Dominant and Indicator Species

Symbol	Scientific Name	Common Name
ATRIP	<i>Atriplex</i>	Saltbush
CHVI8	<i>Chrysothamnus viscidiflorus</i>	Yellow rabbitbrush
POSE	<i>Poa secunda</i>	Sandberg bluegrass
ELEL5	<i>Elymus elymoides</i>	Squirreltail
ACHY	<i>Achnatherum hymenoides</i>	Indian ricegrass
SARCO	<i>Sarcobatus</i>	Greasewood

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

Disturbance Description

Disturbance is unpredictable. Severe drought and flooding (series of high years) were the most common disturbances. The length and severity of drought in the Great Basin has increased since the beginning of the 20th century.

Fire was rare and perhaps limited to more mesic sites during the presettlement period. Native American manipulation of salt desert shrub plant communities was probably less than nearby higher elevation communities. Grass seed may have been one of the more important salt desert shrub crops. Stand replacement fire occurs infrequently. Mixed severity fire (see Comments about use of mixed severity fire) would favor resprouting shrubs (greasewood, sickle saltbush and fourwing saltbush).

Fire Frequency

Severity	Avg FI	Percent of All Fires	Min FI	Max FI
Replacement	696	100		
Moderate (Mixed)				
Low (Surface)				
All Fires	696	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 BpS typically covers 10s-100s of acres around the fringes of Pleistocene lakebeds and playas.

Adjacency or Identification Concerns

Issues or Problems

It is not known whether insect outbreaks (Mormon crickets or other species) were a primary disturbance factor in Oregon. In some areas of southeast Oregon, cheatgrass has encroached into this BpS and altered fire behavior and frequency.

Native Americans may have manipulated stands to produce grass for weaving, but this thought needs to be further checked.

Lack of citations during model development. There was little/no information about the early successional species and their relationships in this group prior to the advent of aggressive and noxious non-natives during model development. Because of the pervasive replacement of native, early successional species by non-natives, an adequate description of the forb/grass early seral communities may be difficult to complete.

Upland salt desert shrub communities are easily invaded and, in the short term at least, replaced by cheatgrass. Other non-native problematic annuals may include halogeton, Russian thistle and several mustards. Squarrose knapweed, tall whitetop and hoary cress may be other problematic species.

A reviewer commented that “including greasewood communities in this type really throws a monkey wrench into the BpS. It is such a different community – seasonally saturated soils, high density of tall shrubs and can have a dense understory of salt grass. It is so different from upland salt desert shrub communities.”

Native Uncharacteristic Conditions

Shrub cover >40% is uncharacteristic and suggests a different BpS.

Comments

During the 2017 BpS review, this model was part of a “macro-review” where all models representing this BpS were reviewed and evaluated relative to one another. One goal of the review was to check for logical consistency between the models. Outstanding questions from this review that should be evaluated in the future include:

- What is an appropriate fire frequency and severity for this BpS? There is a wide variance in fire frequencies listed among the model set for this BpS ranging from a couple hundred to a couple thousand years. Sands stated in his review that this variation “is a reflection of the lack of data and knowledge on this system rather than actual variation among the mapzones.”

LANDFIRE National reviewers for map zones (MZ)s 7, 8, 9, 15, 16, 22, 23, 24, 27, and 28 indicated that there is no evidence for fire in salt desert shrub during pre-settlement. Research from the US Forest Service Desert Experimental Range supports this and indicates that the reference condition would have been shifting mosaics of communities based of drought, flooding and insect outbreaks.

- Should the concept represented by this BpS/Ecological System be revised? Sands noted that this type actually includes a number of very different vegetation communities: 1) greasewood communities, occupying seasonally saturated lowland soils, grow large, dense shrublands, sometimes with a dense saltgrass herbaceous layer, and 2) shadscale communities, occupying well drained upland soils, grow, short, widely spaced shrubs with sparse herbaceous interspaces. Kori Blankenship noted that MZs 6/12/13/17, 18/19/21, and 27/33 describe

greasewood as an adjacent community, but in MZs 7/8/9 greasewood is included in the Mixed Salt Desert Scrub BpS concept.

MZs 7, 8, and 9 were combined during 2015 BpS review. The succession class structure was adjusted based on the Sands and Laliberte reviews. During the 2017 review, Kori Blankenship reevaluated the use of mixed severity fire in this model. Blankenship changed the Late1 Open to Mid1 Open mixed severity fire transition to replacement severity to comply with LANDFIRE fire severity definitions. LANDFIRE defines replacement severity fire as a fire that top-kills >75% of the upper-layer lifeform. Because Atriplex, the dominant shrub species in the Late1 Open class, is top killed by fire (Howard 2003, Simonin 2001), Blankenship assumed that the modelers used mixed fire to represent a very patchy fire, but because where fire occurred it probably top-killed most plants it met LANDFIRE's replacement fire criteria.

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	UN	UN	UN	UN	UN
Herb	0.5-1.0	A	A	A	A	A	UN	UN	UN	UN	UN
Herb	>1.0	A	A	A	A	A	UN	UN	UN	UN	UN
Shrub	0-0.5	A	B	C	C	UN	UN	UN	UN	UN	UN
Shrub	0.5-1.0	A	B	C	C	UN	UN	UN	UN	UN	UN
Shrub	1.0-3.0	A	B	C	C	UN	UN	UN	UN	UN	UN
Shrub	>3.0	A	B	C	C	UN	UN	UN	UN	UN	UN
Tree	0-5	C	UN	UN	UN	UN	UN	UN	UN	UN	UN
Tree	5-10	C	UN	UN	UN	UN	UN	UN	UN	UN	UN
Tree	10-25	C	UN	UN	UN	UN	UN	UN	UN	UN	UN
Tree	25-50	C	UN	UN	UN	UN	UN	UN	UN	UN	UN
Tree	>50	C	UN	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	7	Early Development 1 - All Structures
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Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
POSE	<i>Poa secunda</i>	Sandberg bluegrass	Mid-Upper
ELEL5	<i>Elymus elymoides</i>	Squirreltail	Upper
ACHY	<i>Achnatherum hymenoides</i>	Indian ricegrass	Upper

Model Parameters

Deterministic Transitions

From Class	Begins at (yr)	Succeeds to	After (years)
Early1:ALL	0	Mid1:OPN	9
Mid1:OPN	10	Late1:OPN	39
Late1:OPN	40	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
Wind or Weather or Stress	Early1:ALL	Early1:ALL	0.014	71	Yes	0
Replacement Fire	Mid1:OPN	Early1:ALL	0.001	1000	Yes	0
Replacement Fire	Late1:OPN	Mid1:OPN	0.001	1000	Yes	0
Replacement Fire	Late1:OPN	Early1:ALL	0.001	1000	Yes	0
Wind or Weather or Stress	Late1:OPN	Early1:ALL	0.0125	80	Yes	0
Wind or Weather or Stress	Late1:OPN	Mid1:OPN	0.0133	75	Yes	0

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