

10820

Mojave Mid-Elevation Mixed Desert Scrub

BpS Model/Description Version: Aug. 2020

Modelers		Reviewers	
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Vegetation Type

Shrubland

Map Zones

12, 15, 16, 17, 23, 24

Geographic Range

Mojave Mid-Elevation Desert Scrub (where blackbrush is dominant) occurs in the southern Great Basin region, in the Mojave desert from California through Nevada to Utah and Arizona. Within the Mojave-Colorado Plateau ecotone, blackbrush is found on dry slopes and benches above the river canyons of southern Utah and northern Arizona. It is also found midslope on mountain ranges throughout this area.

Biophysical Site Description

Blackbrush occurs at the bioregional transition between the Mojave Desert and Great Basin deserts, in the Mojave Desert, and the Colorado Plateau of southeastern UT. It occurs on mesic and thermic soils, which are shallow to a root restrictive layer, on low hills and mountains and broad alluvial fans. It is also common on lower piedmont slopes in the transition zone into the southern Great Basin. Elevation ranges from 2,200-4,500ft. The main difference between Mojave Desert and Colorado Plateau blackbrush communities (eg, Colorado Plateau Blackbrush-Mormon tea Shrubland, 1078) is the higher proportion of sandy soils on the Colorado Plateau.

Vegetation Description

The vegetation in this BpS is quite variable. Co-dominants and diagnostic species include *Coleogyne ramosissima* (blackbrush), *Eriogonum fasciculatum*, *Ephedra nevadensis*, *Grayia spinosa*, *Menodora spinescens*, *Opuntia acanthocarpa*, *Pleuraphis rigida*, *Salazaria mexicana*, *Viguiera parishii*, *Yucca brevifolia*, or *Yucca schidigera*. The dominant shrub of the Mojave Mid-Elevation Desert Scrub is blackbrush (*Coleogyne ramosissima*). Blackbrush is considered to be one of the most flammable native plant assemblages in the Mojave Desert, although this desert does not have a history of fire. There are many ecological site descriptions in the Mojave Desert and the bioregional transition between the Mojave Desert and Great Basin or Colorado Plateau that describe the various sites by vegetation composition and soils published by the NRCS. In general terms, blackbrush dominates the site with 80-90% of total cover. Although 185 species of vascular plants have been found growing within blackbrush, they are never abundant in the Mojave Desert, except at upper- and lower-elevational ecotones. Desert grasses,

including *Achnatherum hymenoides*, *Achnatherum speciosum*, *Muhlenbergia porteri*, *Pleuraphis jamesii*, *Pleuraphis rigida*, or *Poa secunda*, may form an herbaceous layer. Scattered *Juniperus osteosperma* or desert scrub species may also be present. These species, however, are somewhat more abundant on the Colorado Plateau on sandier soils. For instance, desert needlegrass (*Achnatherum speciosum*) and Indian ricegrass (*Oryzopsis hymenoides*) are important grass species. Beatley (1976) stated that "so nearly complete is the dominance of this shrub species that in areas that are not ecotonal there are only a few associated shrubs species, and these occur usually as scattered plants in an otherwise pure stand of *Coleogyne*."

Understory and associated species vary with soil type. Sandy sites in southeastern UT have a greater perennial grass component (mainly Indian ricegrass and dropseeds) than the shallow calcareous soils in the Mojave Desert. On the isolated mesas in the Grand Canyon there is an interesting relationship between soil depth, site location on the landscape and associated species. Grazing has not confounded these relationships because the only ungulate grazing has been by desert bighorns. Shallow soils over a petrocalcic horizon have very little perennial grass. The deep soils on "run in" sites have much greater perennial grass and associated shrub (eg, fourwing saltbush) cover. According to Ledyard Stebbins blackbrush has been around for a long time; experts refer to it as a paleoendemic.

BpS Dominant and Indicator Species

Symbol	Scientific Name	Common Name
CORA	<i>Coleogyne ramosissima</i>	Blackbrush
ACSP12	<i>Achnatherum speciosum</i>	Desert needlegrass
BOER4	<i>Bouteloua eriopoda</i>	Black grama
AMDU2	<i>Ambrosia dumosa</i>	Burrobush

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

Disturbance Description

Low amounts of fine fuel in interspaces probably limited fire spread to only extreme fire conditions, during which high winds, low relative humidity, and low fuel moisture led to high-intensity stand-replacing crown fires. Historical fire return intervals appear to have been on the order of centuries, allowing late seral blackbrush stands to reestablish.

Fire Frequency

Severity	Avg FI	Percent of All Fires	Min FI	Max FI
Replacement	831	100	100	1700
Moderate (Mixed)				
Low (Surface)				
All Fires	831	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

Although the BpS can be extensive (>100,000ac) in the Mojave Desert, it is likely smaller where it reaches into the Great Basin (1,000ac). The typical scale of common disturbance extent ranges from 100-1,000ac. Exceptions do occur in excess of 1,000s of acres.

Adjacency or Identification Concerns

At upper elevations, adjacent ecological systems include black sagebrush and Wyoming big sagebrush communities and at lower elevations creosotebush and bursage communities in the Mojave Desert.

Within the upper and lower extents of this BpS there are areas degraded from overgrazing and prescribed burning in the mid-1900s, characterized by burned patches with early seral characteristics. In these sites there is increased cover of early seral shrubs such as *Chrysothamnus* spp., *Gutierrezia* spp., and *Eriogonum fasciculatum*, early seral herbaceous perennials such as *Sphaeralcea ambigua* and *Astragalus* spp., and alien annual plants such as *Bromus rubens*, *Bromus tectorum*, and *Erodium cicutarium*. Burned stands can also have a large perennial grass component. Other areas are annual grasslands dominated by *Bromus rubens* and *Bromus tectorum* from repeated burning.

Issues or Problems

We don't have much data on this community.

Native Uncharacteristic Conditions

Native shrub cover >50% (remote sensing) is considered uncharacteristic.

Comments

For LANDFIRE National Tim Christiansen reviewed the model developed for zones 15, 23 and 24.

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	A	A	A	B	UN	UN	UN	UN	UN
Shrub	0.5-1.0	B	B	B	B	B	UN	UN	UN	UN	UN
Shrub	1.0-3.0	B	B	B	B	B	UN	UN	UN	UN	UN
Shrub	>3.0	B	B	B	B	B	UN	UN	UN	UN	UN
Tree	0-5	B	B	B	B	B	UN	UN	UN	UN	UN
Tree	5-10	B	B	B	B	B	UN	UN	UN	UN	UN
Tree	10-25	B	B	B	B	B	UN	UN	UN	UN	UN
Tree	25-50	B	B	B	B	B	UN	UN	UN	UN	UN
Tree	>50	B	B	B	B	B	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	12	Early Development 1 - All Structures
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Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
GUSA2	Gutierrezia sarothrae	Broom snakeweed	Upper
MESP2	Menodora spinescens	Spiny menodora	Upper
EPNE	Ephedra nevadensis	Nevada jointfir	Upper
TETRA3	Tetradymia	Horsebrush	Upper

Description

Historically, fire was relatively uncommon in this vegetation. When burned, the fire-tolerant/crown-sprouting shrubs such as spiny menodora, horsebrush, and snakeweed will dominate the site. At higher elevations of mesic blackbrush, a big sagebrush-desert bitterbrush community typically replaces blackbrush for a protracted period. This class can express itself for more than 100 years with varying amounts of blackbrush gradually establishing after decades. A few examples of this that have been observed in the field are believed to be over 60yrs+ old. The ground cover varies by elevation and moisture regime with mesic sites being generally 0-35%, with some sites only capable of 10% cover. The thermic sites are generally 10-15% ground cover, with exceptions going as high as 35%.

Maximum Tree Size Class

None

Class B	88	Late Development 1 - Closed
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Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
CORA	Coleogyne ramosissima	Blackbrush	Upper
EPNE	Ephedra nevadensis	Nevada jointfir	Upper
YUSC2	Yucca schidigera	Mojave yucca	Upper
LATR2	Larrea tridentata	Creosote bush	Upper

Description

This community class seems to be stable and occurs after a threshold is crossed. Composition is 70-80% blackbrush-dominated. Other species are perennial grasses of desert needlegrass, Indian ricegrass, galleta grass, fluff grass, and threeawn. Lesser shrub composition includes Nevada ephedra, turbineila oak, desert bitterbrush, fourwing saltbush, and Anderson's wolfberry in mesic sites and Nevada ephedra, creosotebush, Mojave buckwheat, snakeweed, prickly pear, white bursage, and spiny menodora in thermic sites. There are other shrubs also.

Maximum Tree Size Class

None

Model Parameters

Deterministic Transitions

From Class	Begins at (yr)	Succeeds to	After (years)
Early1:ALL	0	Late1:CLS	119
Late1:CLS	120	Late1:CLS	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:ALL	Early1:ALL	0.003	333	Yes	0
Replacement Fire	Late1:CLS	Early1:ALL	0.001	1000	Yes	0

References

Beatley, J.C. 1976. Vascular Plants of the Nevada Test Site and Central-Southern Nevada: Ecological and Geographic Distributions. Energy Research and Development Administration TID-26881. Technical Information Center, Office of the Technical Information, Springfield Virginia. 308 pp.

Brooks, M.L. and J.R. Matchett. 2003. Plant Community Patterns in Unburned and Burned Blackbrush (*Coleogyne ramosissima* Torr.) Shrublands in the Mojave Desert. Western North American Naturalist 63 (3): 283-298.

Brooks, M.L., T.C. Esque and T. Duck, 2003. Fuels and Fire Regimes in Creosotebush, Blackbrush, and Interior Chaparral Shrublands. Report for the Southern Utah Demonstration Fuels Project. USDA Forest Service. Rocky Mountain Research Station, Montana. 18 pp.

Callison, J, J.D. Brotherson and J.E. Bowns. 1985. The effects of fire on the blackbrush (*Coleogyne ramosissima*) community of southwestern Utah. Journal of Range Management. 38(6): 535-538.

Haines, D.F., T.C. Esque, L.A. DeFalco, S.J. Scoles, M.L. Brooks and R.H. Webb. 2003. Fire and exotics in the Mojave Desert: an irreversible change? US Department of the Interior, US Geological Survey. Presentation available at: <http://www.dmg.gov/resto-pres/mon-08-haines.pdf>.

NatureServe. 2007. International Ecological Classification Standard: Terrestrial Ecological Classifications. NatureServe Central Databases. Arlington, VA. Data current as of 10 February 2007.

USDA-NRCS. 2002, Rangeland Ecological Site Descriptions, Technical guide section 11E, Las Vegas NV FO and Caliete, NV FO. Available online: <http://esis.sc.egov.usda.gov/Welcome/pgESDWelcome.aspx>.

