

10620

Inter-Mountain Basins Curl-Leaf Mountain Mahogany Woodland and Shrubland

BpS Model/Description Version: Aug. 2020

Modelers		Reviewers	
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None	None	None	None

Vegetation Type

Forest and Woodland

Map Zones

7, 9

Geographic Range

The curl-leaf mountain mahogany (*Cercocarpus ledifolius* var. *intermontanus*) type occurs in eastern Oregon, northern Nevada, southern Idaho, and northeastern California (possibly eastern Washington), and grades into similar systems in the central Rocky Mountains.

Biophysical Site Description

Curl-leaf mountain mahogany (*Cercocarpus ledifolius* var. *intermontanus*) is usually found on slopes, ridges, rimrock, and canyons between 2,000ft and 8,000ft elevation (Marshall 1995). Most stands are found on rocky shallow soils and outcrops, with mature stand cover between 10% and 55%. In absence of fire, stands may occur on somewhat deeper soils, with >55% cover.

Vegetation Description

Mountain big sagebrush is the most common co-dominant with curl-leaf mountain mahogany. Curl-leaf mountain mahogany is both a primary early successional colonizer rapidly invading bare mineral soils after disturbance and the dominant long-lived species. Where curl-leaf mountain mahogany has reestablished quickly after fire, rabbitbrush (*Chrysothamnus nauseosus*) may co-dominate. Litter and shading by woody plants inhibit establishment of curl-leaf mountain mahogany. Reproduction often appears dependent upon geographic variables (slope, aspect, and elevation) more than biotic factors. Snowberry, serviceberry, aspen, and currant are present on cooler sites with more moisture. Western juniper and ponderosa pine are often present, with <10% total cover in forested zones. In old, closed-canopy stands, understory may consist largely of prickly phlox (*Leptodactylon pungens*), pinegrass, Idaho fescue, or Sherman big bluegrass.

BpS Dominant and Indicator Species

Symbol	Scientific Name	Common Name
CELE3	<i>Cercocarpus ledifolius</i>	Curl-leaf mountain mahogany
ARTRV	<i>Artemisia tridentata</i> ssp. <i>vaseyana</i>	Mountain big sagebrush
PUTR2	<i>Purshia tridentata</i>	Antelope bitterbrush
SYMPH	<i>Symphoricarpos</i>	Snowberry

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

Disturbance Description

There are three significant disturbances to this type of vegetation. Fire: Curl-leaf mountain mahogany does not resprout and is killed easily by fire (Marshall 1995). (However, reviewers offered that resprouts have been observed in south-central, and southeast Oregon.) Curl-leaf mountain mahogany is a primary early successional colonizer rapidly invading bare mineral soils after disturbance. Fires are not common in early-seral stages when there is little fuel.

Replacement fire (mean fire return interval [MFRI], 100-500yrs) becomes more common in mid-seral stands, where herbs and smaller shrubs provide ladder fuel. By late succession, two classes and fire regimes are possible, depending on the history of rare surface fires. In the presence of surface fire and past mixed-severity fires in younger classes, the stand will adopt a savanna-like woodland structure with a grassy understory. Trees can become very old and will show fire scars. In late, closed stands, the absence of herbs and small forbs makes replacement fire uncommon, requiring extreme winds and drought. In such cases, thick duff provides fuel for more intense fires. Mixed fires are present in all classes, except the Late-Closed Class, and are more frequent in the Mid-Development classes. (Reviewers felt that the summed fire regime [MFRI, 76yrs] seemed too frequent [especially in the mountains in the south of map zone {MZ} 9], but they were unable to identify which of the sub-types was contributing too much.)

Ungulate herbivory: Heavy browsing by native medium-size and large mammals reduces mountain mahogany productivity and reproduction (USDA-NRCS 2003). This is an important disturbance in early- (especially) and mid-seral stages, when mountain mahogany seedlings are becoming established. Browsing by small mammals has been documented (Marshall 1995), but is relatively unimportant and was incorporated as a minor component of native herbivory-caused mortality.

Avian-caused mortality: In western Nevada for ranges in close proximity to the Sierra Nevada, sapsucker drilling of curl-leaf mountain mahogany has been observed to cause stand-replacement mortality (Christopher Ross, Nevada BLM, pers. comm.). Reviewers in Oregon commented that this disturbance is extremely rare, and even then would only be noticeable in small (1-5ac) patches, not larger patches.

Fire Frequency

Severity	Avg FI	Percent of All Fires	Min FI	Max FI
Replacement	242	32	100	500
Moderate (Mixed)	212	36		
Low (Surface)	243	32		
All Fires	77	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

Because these communities are generally restricted to rock outcrops and thin soils, stands usually occur on a small scale and are spatially separated from each other by other communities that occur on different aspects or soil types. A few curl-leaf mountain mahogany stands may be much larger than 100ac.

Adjacency or Identification Concerns

[illegible]

Description

Young curl-leaf mountain mahogany are common, although shrub diversity is very high. Herbivores clearly impact this type because it is very palatable.

Maximum Tree Size Class

None

Class C	14	Mid Development 1 - Closed
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Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
CELE3	Cercocarpus ledifolius	Curl-leaf mountain mahogany	Upper
ARTRV	Artemisia tridentata ssp. Vaseyana	Mountain big sagebrush	Middle
CHRY5	Chrysactinia	Chrysactinia	Middle
SYMPH	Symphoricarpos	Snowberry	Middle

Description

Curl-leaf mountain mahogany is dominant, with mature sagebrush, bitterbrush, snowberry, and rabbitbrush co-dominant. Few mountain mahogany seedlings are present.

Maximum Tree Size Class

None

Class D	41	Late Development 1 - Open
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Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
CELE3	<i>Cercocarpus ledifolius</i>	Curl-leaf mountain mahogany	Upper
ARTRV	<i>Artemisia tridentata</i> ssp. <i>vaseyana</i>	Mountain big sagebrush	Mid-Upper
PUTR2	<i>Purshia tridentata</i>	Antelope bitterbrush	Mid-Upper

Description

Moderate cover of mountain mahogany. This class represents one of two late-successional endpoints for curl-leaf mountain mahogany. Evidence of fire scars on older trees and presence of open savanna-like woodlands with herbaceous-dominated understory are evidence for this condition. Other shrub species may be abundant, but decadent. In the absence of fire, the stand will eventually become closed and not support a herbaceous understory.

Maximum Tree Size Class

None

Class E	29	Late Development 2 - Closed
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Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
CELE3	Cercocarpus ledifolius	Curl-leaf mountain mahogany	Upper
SYMPH	Symphoricarpos	Snowberry	Middle
ARTRV	Artemisia tridentata ssp. vaseyana	Mountain big sagebrush	Middle
FEID	Festuca idahoensis	Idaho fescue	Lower

Description

High cover of large shrub or tree-like mountain mahogany. Very few other shrubs are present and herb cover is low. Duff may be very deep. Scattered trees may occur in this class. Class will become old-growth.

Maximum Tree Size Class

None

Model Parameters

Deterministic Transitions

From Class	Begins at (yr)	Succeeds to	After (years)
Early1:ALL	0	Mid1:CLS	9
Mid1:CLS	10	Mid1:OPN	49
Mid1:OPN	50	Late1:OPN	99
Late1:OPN	100	Late1:OPN	999
Late2:CLS	150	Late2: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	0.005	200	Yes	0
Mixed Fire	Early1:ALL	Early1:ALL	0.01	100	No	0
Native Grazing	Early1:ALL	Early1:ALL	0.02	50	Yes	0
Native Grazing	Mid1:OPN	Mid1:OPN	0.001	1000	No	0
Replacement Fire	Mid1:OPN	Early1:ALL	0.01	100	Yes	0
Mixed Fire	Mid1:OPN	Mid1:OPN	0.013	77	No	0
Replacement Fire	Mid1:CLS	Early1:ALL	0.0067	149	Yes	0
Native Grazing	Mid1:CLS	Mid1:CLS	0.01	100	No	0
Mixed Fire	Mid1:CLS	Mid1:CLS	0.02	50	No	0
Alternative Succession	Late1:OPN	Late2:CLS	1	1	Yes	200
Replacement Fire	Late1:OPN	Early1:ALL	0.003	333	Yes	0

Surface Fire	Late1:OPN	Late1:OPN	0.01	100	No	0
Replacement Fire	Late2:CLS	Early1:ALL	0.002	500	Yes	0

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