Ecological site R010XB057OR
JD Mahogany Rockland 9-12 PZ

Accessed: 05/10/2025

General information

Provisional. A provisional ecological site description has undergone quality control and quality assurance review. It contains a working state and transition model and enough information to identify the ecological site.

Associated sites

R010XB051OR	**JD Shallow South 9-12 PZ** South aspect, shallow soils

Similar sites

R010XB051OR	**JD Shallow South 9-12 PZ**

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Cercocarpus ledifolius* (2) *Purshia tridentata*
Herbaceous	(1) *Pseudoroegneria spicata ssp. spicata* (2) *Poa secunda*

Physiographic features

This site is on steep south facing slopes. Slopes range from 15 to 80 percent but are typically from 15 to 70 percent. Elevations range from 1300 to 3000 feet.

Table 2. Representative physiographic features

Landforms	(1) Canyon (2) Ridge
Flooding frequency	None to very frequent
Ponding frequency	None
Elevation	1,300–3,000 ft
Slope	15–80%
Ponding depth	0 in
Water table depth	60 in
Aspect	SE, S, SW

Climatic features

The annual precipitation ranges from 9-12 inches, most of which occurs in the form of rain during the months of November through May. Localized, occasionally severe, convectional storms occur during the summer. The mean annual air temperature is 54 degrees F. Temperature extremes range from 105 to +10 degrees F. The frost-free

period ranges from 116 to 135 days. The optimum period for plant growth is from April through June3

Table 3. Representative climatic features

Frost-free period (average)	132 days
Freeze-free period (average)	162 days
Precipitation total (average)	12 in

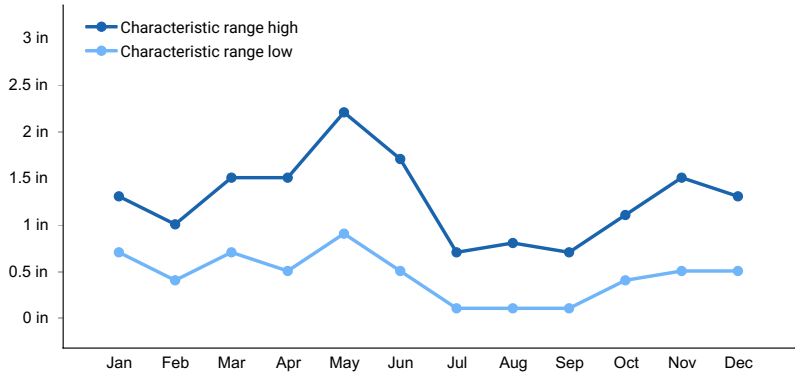

Figure 1. Monthly precipitation range

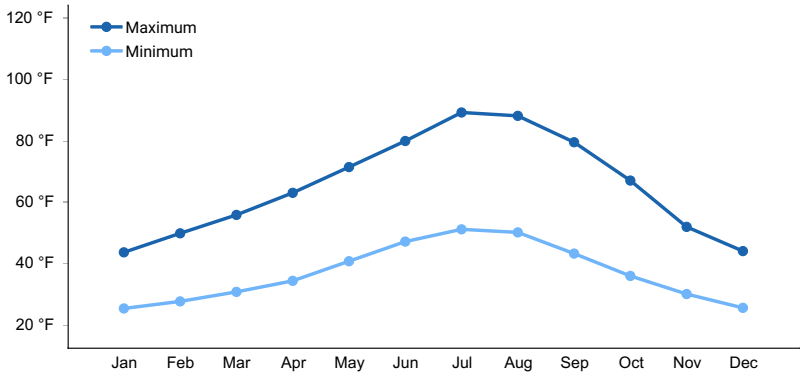

Figure 2. Monthly average minimum and maximum temperature

Influencing water features

Soil features

The soils of this site are typically very shallow over fractured basalt bedrock. They are well-drained with areas of rock outcrop. These soils occur on unstable positions and have little structural development. Texture is a gravelly or cobbly loam. Depth to bedrock or an indurated pan is usually less than 10 inches. Permeability is moderate. The available water holding capacity is about 2 inches for the profile. The potential for erosion is severe.

Table 4. Representative soil features

Surface texture	(1) Very cobbly loamy coarse sand
Drainage class	Somewhat excessively drained
Permeability class	Rapid
Soil depth	1–10 in
Surface fragment cover <=3"	0–30%
Surface fragment cover >3"	0–20%
Available water capacity (0-40in)	2 in

Calcium carbonate equivalent (0-40in)	0%
Electrical conductivity (0-40in)	0 mmhos/cm
Sodium adsorption ratio (0-40in)	0
Soil reaction (1:1 water) (0-40in)	7.9–8.4
Subsurface fragment volume <=3" (Depth not specified)	0–30%
Subsurface fragment volume >3" (Depth not specified)	0–20%

Ecological dynamics

Range in Characteristics:

Bluebunch wheatgrass increases with an increase in soil depth. Mountain Mahogany, bitterbrush, and other shrubs respond to available moisture in rock fissures and cracks. The proportion and amount of these shrubs are proportional to the extent and depth of fracturing in the bedrock. Fires on this site are very infrequent, being estimated to occur at intervals of 250 to 500 years.

Response to Disturbance:

If the conditions of the site deteriorates as a result of overgrazing, bluebunch wheatgrass decreases while Sandberg bluegrass increases. Bluebunch wheatgrass is the preferred species during the spring. With further deterioration, mountain mahogany and other shrubs become well hedged. Under deteriorated conditions excessive erosion in the bare soil interspaces markedly reduces the site productivity.

Treatment Response: none.

Reference Plant Community

State 1 – Reference State

There are three phases in the reference state. Phase 1.1 is the mountain mahogany steppe phase dominated by mountain mahogany and bluebunch wheatgrass with antelope bitterbrush being common. The mountain mahogany perennial grass and forb phase, 1.2, results from the occurrence of fire. Phase 1.3 has an increase of juniper as a result of no fire and improper grazing.

Phase 1.1 the mountain mahogany phase, the reference plant community phase (RPCP), is dominated by mountain mahogany in the overstory, antelope bitterbrush in the shrub layer and bluebunch wheatgrass in the herbaceous layer. Sandberg bluegrass and Thurber’s needlegrass are common with a minor amount of forbs. Vegetative composition of the community is approximately 30 percent grasses, 5 percent forbs, and 65 percent shrubs and trees. Approximate ground cover is 20-30 percent.

Phase 1.2, the mountain mahogany, perennial grass and forb phase results from fire that burns the understory and shrub and herbaceous species with minimal impact to the overstory mountain mahogany (1.1A). In the long interval between fires the shrub component reestablishes (1.2A) and the community moves toward phase 1.1. With no fire and improper grazing (1.1B) juniper can establish on the site and dominate or co-dominate with the mountain mahogany in the juniper-mountain mahogany phase (1.3)

Phase 1.3 the juniper-mountain mahogany phase results from phase 1.1 and 1.2 when there is no fire and improper grazing allows juniper to establish and become co-dominant with mountain mahogany with a component of shrubs and herbaceous vegetation. With the introduction of fire and prescribed grazing (1.3A) the plant community moves back to phase 1.1. Phase 1.3 is the “at risk” plant community phase in State 1. With continued improper grazing

and no fire (IRT1A) the juniper becomes dominant and the site transitions to State 2 where juniper controls all of the ecological processes. A crown fire that eliminates all of the juniper and mountain mahogany (IRT1B) will move the community to State 3 a cheatgrass-shrub dominated community.

State 2 is a state dominated by juniper and mountain mahogany. Phase 2.1 maintains only a very sparse component of shrubs, grasses and forbs. As the juniper matures it becomes the juniper woodland phase (2.2) with juniper in complete control of the ecological processes. There is no potential repair pathway for this state to state 1 due to the steepness of the site, very shallow soils, low available water capacity and high erosion potential.

State 3 is cheatgrass and shrub dominated as a result of improper grazing and severe fire (IRT1B) in the juniper-mountain mahogany phase (1.3) or severe fire, improper grazing and drought (IRT2A) in the juniper woodland phase (2.2). This process eliminates the woody overstory components and allows the increase of cheatgrass which gains control of the site ecological processes. There is no potential repair pathway for this state to state 1 due to the steepness of the site, very shallow soils, low available water capacity and high erosion potential.
State 4 is the eroded state of this site. Improper grazing and fire (IRT2B and IRT3A) in the juniper woodland phase (2.2) and the cheatgrass shrub phase (3.1) exposes significant amounts of bare ground which leads to severe erosion.

State and transition model

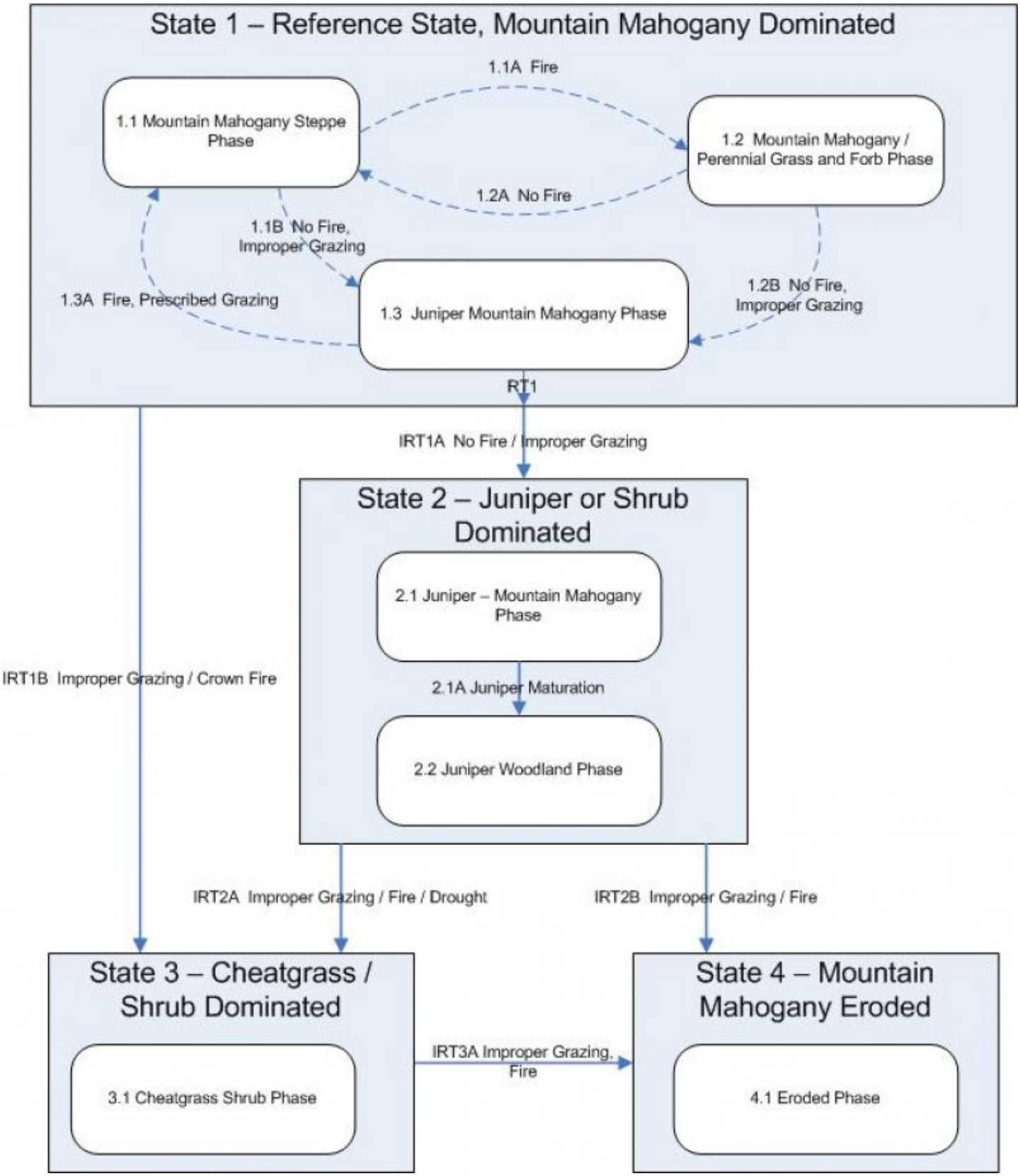

Figure 3. JD MAHOGANY ROCKLAND 9-12 PZ - R010XB057OR

State 1
Reference Plant Community

Community 1.1
Reference Plant Community

The reference plant community phase is dominated by curlleaf mountain mahogany, antelope bitterbrush and bluebunch wheatgrass. Sandberg bluegrass and Thurber's needlegrass are common in the stand. Vegetative composition of the community is approximately 30 percent grasses, 5 percent forbs, and 65 percent shrubs and

trees. Approximate ground cover is 20-30 percent.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Shrub/Vine	195	385	575
Grass/Grasslike	90	180	270
Forb	15	30	45
Tree	0	5	10
Total	**300**	**600**	**900**

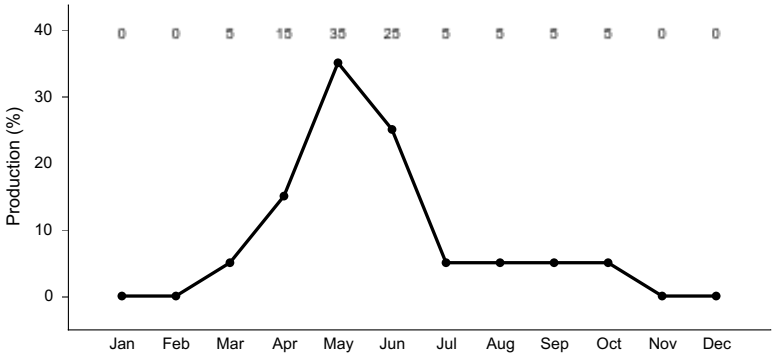

Figure 5. Plant community growth curve (percent production by month). OR4251, B10 JD Mahog. Rockland 9-12 RPC. B10XB JD Mahog. Rockland 9-12 RPC.

Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	**Perennial, deep-rooted, dominant**			70–180	
	bluebunch wheatgrass	PSSP6	*Pseudoroegneria spicata*	70–180	–
2	**Perennial, deep-rooted**			12–42	
	Thurber's needlegrass	ACTH7	*Achnatherum thurberianum*	8–30	–
	Idaho fescue	FEID	*Festuca idahoensis*	4–12	–
4	**Perennial, shallow-rooted**			8–48	
	Sandberg bluegrass	POSE	*Poa secunda*	8–48	–
Forb					
5				12–24	
	buckwheat	ERIOG	*Eriogonum*	3–6	–
	desertparsley	LOMAT	*Lomatium*	36–6	–
	beardtongue	PENST	*Penstemon*	3–6	–
	phlox	PHLOX	*Phlox*	3–6	–
7	**Other perennial forbs**			3–9	
	common yarrow	ACMI2	*Achillea millefolium*	0–3	–
	pussytoes	ANTEN	*Antennaria*	0–3	–
	erigenia	ERIGE	*Erigenia*	0–3	–
	phacelia	PHACE	*Phacelia*	0–3	–
	stonecrop	SEDUM	*Sedum*	0–3	–
Shrub/Vine					
11	**Perennial, evergreen**			160–430	
	curl-leaf mountain mahogany	CELE3	*Cercocarpus ledifolius*	160–430	–
12	**Perennial, evergreen**			20–100	
	antelope bitterbrush	PUTR2	*Purshia tridentata*	20–100	–
14	**Perennial, deciduous**			5–15	
	hackberry	CELTI	*Celtis*	5–15	–
15	**Other shrubs**			10–30	
	yellow rabbitbrush	CHVI8	*Chrysothamnus viscidiflorus*	5–15	–
	currant	RIBES	*Ribes*	5–15	–
Tree					
16	**Perennial, evergreen**			0–10	
	western juniper	JUOC	*Juniperus occidentalis*	0–10	–

Animal community

Livestock Grazing:

This site is not suited for use by livestock. Limitations are unstable soils, steep and rocky slopes.

Native Wildlife Associated with the Potential Climax Community:

Mule deer
Hawks
Rodents

Songbirds

This site provides critical cover and forage for deer during winter.

Hydrological functions

The soils are in hydrologic group D. The soils of this site have high runoff potential.

Type locality

Location 1: Grant County, OR	
Township/Range/Section	T12S R26E S18
General legal description	Hwy 26 and Hwy 19 junction, Picture Gorge Area-John Day Fossil Beds National Monument.

Other references

Stringham, Tamzen, 2007. Final Report for USDA Ecological Site Description. Oregon State University, Corvallis, Oregon.

USDI Bureau of Land Management, US Geological Survey; USDA Natural Resources Conservation Service, Agricultural Research Service; Interpreting Indicators of Rangeland Health. Technical Reference 1734-6; Version 4-2005.

Contributors

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Rangeland health reference sheet

Interpreting Indicators of Rangeland Health is a qualitative assessment protocol used to determine ecosystem condition based on benchmark characteristics described in the Reference Sheet. A suite of 17 (or more) indicators are typically considered in an assessment. The ecological site(s) representative of an assessment location must be known prior to applying the protocol and must be verified based on soils and climate. Current plant community cannot be used to identify the ecological site.

Author(s)/participant(s)	James A. Cornwell, State Rangeland Management Specialist, NRCS, Idaho (Retired) Lee Brooks, Assistant State Conservationist, NRCS, Idaho (Retired).
Contact for lead author	State Rangeland Management Specialist for NRCS – Oregon
Date	09/09/2009
Approved by	Bob Gillaspy
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** Rills can occur on this site, especially on the steeper slopes.

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2. **Presence of water flow patterns:** None

3. **Number and height of erosional pedestals or terracettes:** None

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 70 to 80%.

5. **Number of gullies and erosion associated with gullies:** None.

6. **Extent of wind scoured, blowouts and/or depositional areas:** Does not occur on this site.

7. **Amount of litter movement (describe size and distance expected to travel):** Fine. Litter movement, typically would be < two feet.

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** stability values should range from 3 to 5, but needs to be verified.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Soil surface structure is single grained. SOM ranges from 0.5 to 1.0 percent.

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Moderate plant cover (20-30% basal and crown) mediates the rainfall impact even on steeper slopes (40-80%). The root mass of perennial bunchgrasses provides significant soil stability.

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** The soils are shallow to bedrock or an indurated pan.

12. **Functional/Structural Groups (list in order of descending dominance by above-ground annual-production or live foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):**

    Dominant: Tall shrubs>

    Sub-dominant: Deep-rooted, perennial, cool season bunchgrasses>

    Other: Shallow-rooted, perennial, cool season bunchgrasses > Forbs > trees

    Additional:

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Normal decadence would be expected in both the mountain mahogany and the bunchgrasses.

14. **Average percent litter cover (%) and depth (in):**

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** Favorable: 900; Normal: 600; Unfavorable: 300 lbs/ac/yr.

16. **Potential invasive (including noxious) species (native and non-native). List species which BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicators, we are describing what is NOT expected in the reference state for the ecological site:** Russian, diffuse, and spotted knapweed and cheatgrass.

17. **Perennial plant reproductive capability:** All species should be capable of reproducing annually. Mountain mahogany is a prolific seed producer.