USDA Natural Resources
Conservation Service

Ecological site R010XB071OR
JD Shrubby Mountain North 12-16 PZ

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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.

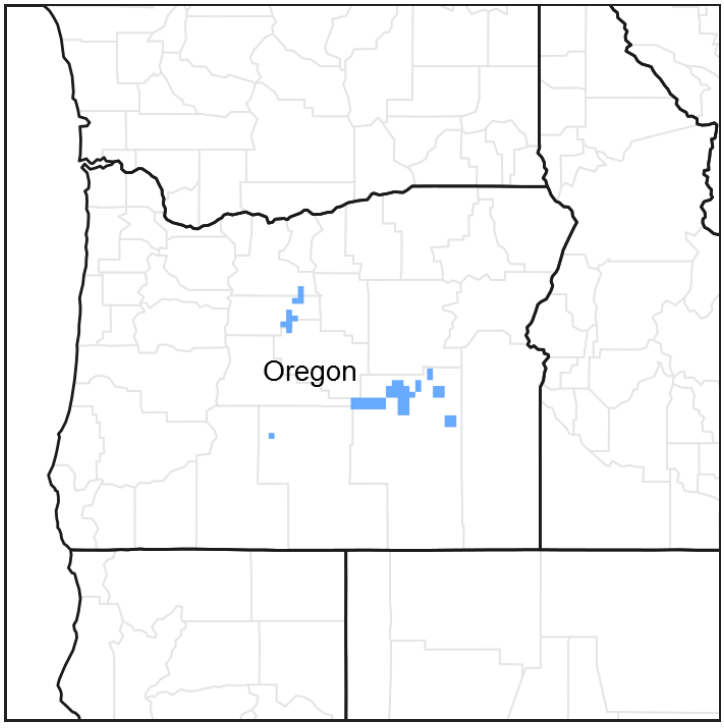


Figure 1. Mapped extent

Areas shown in blue indicate the maximum mapped extent of this ecological site. Other ecological sites likely occur within the highlighted areas. It is also possible for this ecological site to occur outside of highlighted areas if detailed soil survey has not been completed or recently updated.

Associated sites

R010XB028OR	**JD Shrubby Mountain 12-16 PZ** Non-aspect site with fewer shrubs

R010XB046OR	**JD Shrubby Mountain South 12-16 PZ** South aspect, lower production, dominated by bluebunch wheatgrass, fewer shrubs

Similar sites

R010XC066OR	**SR Mountain North 12-16 PZ** More grass production, fewer shrubs, dominated by mountain big sagebrush with antelope bitterbrush a subdominate

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Purshia tridentata* (2) *Artemisia tridentata var. vaseyana*
Herbaceous	(1) *Festuca idahoensis*

Physiographic features

This site occurs on north aspects of terraces, tablelands, and mountain plateaus. Slopes range from 12 to 50 percent. Elevations range from 4500 to 6000 feet.

Table 2. Representative physiographic features

Landforms	(1) Mountain slope (2) Hill
Flooding frequency	None
Ponding frequency	None
Elevation	4,500–6,000 ft
Slope	12–50%
Aspect	N

Climatic features

The annual precipitation ranges from 12 to 16 inches, most of which occurs in the form of snow during the months of November through March. Localized, occasionally severe, convectional storms occur during the summer. The soil temperature regime is frigid to near frigid with a mean annual air temperature of about 45 degrees F. Temperature extremes range from 90 to -30 degrees F. The frost-free period ranges from 30 to 70 days. The optimum period for plant growth is from April through July.

Table 3. Representative climatic features

Frost-free period (average)	70 days
Freeze-free period (average)	40 days
Precipitation total (average)	16 in

Influencing water features

Soil features

The soils of this site are typically moderately deep and well-drained. Depth can range from shallow to deep. Typically the surface layer is a loam to shaly loam about 7 inches thick. The subsoil is a very shaly loam to a very gravelly clay loam about 28 inches thick. Depth to shale or highly fractured bedrock may range from 20 to over 40 inches. Permeability is slow to moderate. The available water holding capacity is about 3 to 6.5 inches for the profile. The potential for erosion is moderate to severe.

Table 4. Representative soil features

Surface texture	(1) Very stony loam (2) Channery (3) Gravelly
Family particle size	(1) Clayey
Drainage class	Well drained
Permeability class	Moderate
Soil depth	20–60 in
Surface fragment cover <=3"	17–19%
Surface fragment cover >3"	0–27%
Available water capacity (0-40in)	2.9–6.7 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)	6.1–7.8
Subsurface fragment volume >3" (Depth not specified)	20–43%

Ecological dynamics

Range in Characteristics:

Mountain snowberry increases on steeper slopes. Idaho fescue is the dominant grass while bluebunch wheatgrass increases on east and westerly slopes. Production is highest on steep due north and colluvial toe slopes.

Response to disturbance:

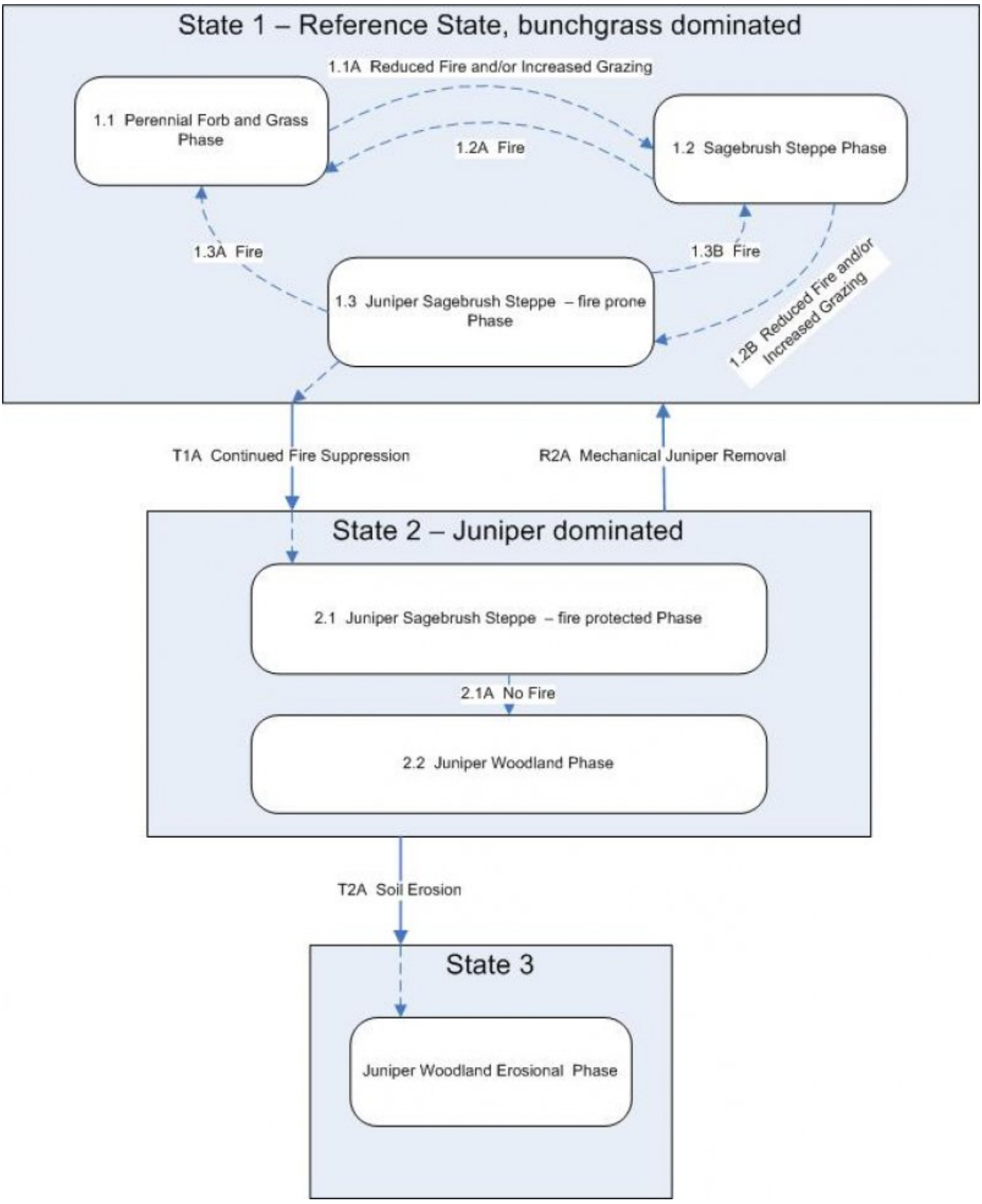
If the condition of the site deteriorates as a result of overgrazing, Idaho fescue decreases while mountain big sagebrush, snowberry, bluebunch wheatgrass and bluegrasses increase. Idaho fescue is the preferred species during spring and summer. With further deterioration, bluebunch wheatgrass and antelope bitterbrush decrease, annuals invade and bare soil interspaces increase.

Fine fuel reduction from improper grazing and fire suppression has led to an increase in the historical fire return interval on many western rangelands. A reduction in fire frequency on these sites leads to an increase in juniper cover, a decrease in sagebrush cover followed by a decrease in herbaceous cover and understory diversity. As juniper encroaches sagebrush declines with a subsequent decrease in forbs, bluebunch wheatgrass and needlegrass. Idaho fescue becomes the primary herbaceous species occurring under the canopy of the juniper trees. Sandberg’s bluegrass increases in the plant community on lower elevation north slopes while bare ground increases in the interspaces between trees. Bitterbrush is more resistant to juniper encroachment than sagebrush and maintains its presence in the community, however vigor and fitness (seed production) may be thwarted. The potential for soil erosion increases as the juniper woodland matures and the understory plant community cover declines. The combined effect of overgrazing and juniper invasion increases the rate of decline in ecological function and the probability of crossing a threshold is high.

Treatment Response

North facing aspects respond positively to juniper removal if soil erosion is not significant. Seeding may be necessary if there are less than 1-2 bunchgrass plants per meter square in the understory. Sagebrush and forbs may also need to be seeded if adult plants are no longer present in the understory.

State and transition model



State 1
Reference

Community 1.1

Reference Plant Community

The potential native plant community is dominated by mountain big sagebrush, antelope bitterbrush, and Idaho fescue. Snowberry, bluebunch wheatgrass, Sandberg bluegrass, and a variety of forbs are present in the stand. Vegetative composition of the community by air-dry weight is approximately 50 percent grasses, 10 percent forbs, and 40 percent shrubs. Foliar cover of Ponderosa pine ranges to a maximum of 5 percent with a minimum of 10 percent antelope bitterbrush. Approximate ground cover is 80-90 percent (basal and crown).

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	600	800	1000
Shrub/Vine	455	610	760
Forb	120	160	200
Tree	25	30	40
Total	**1200**	**1600**	**2000**

Figure 5. Plant community growth curve (percent production by month). OR4181, B10 JD higher elev. RPC. B10XB JD higher elev. 12-16 PZ RPC.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	10	25	25	20	10	5	5	0	0

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**			480–580	
	Idaho fescue	FEID	*Festuca idahoensis*	480–580	–
2	**Perennial, deep-rooted, sub-dominant**			112–224	
	bluebunch wheatgrass	PSSP6	*Pseudoroegneria spicata*	80–160	–
	needlegrass	ACHNA	*Achnatherum*	16–32	–
	basin wildrye	LECI4	*Leymus cinereus*	16–32	–
5	**Other perennial grasses**			16–80	
	Sandberg bluegrass	POSE	*Poa secunda*	0–48	–
	mountain brome	BRMA4	*Bromus marginatus*	0–16	–

	squirreltail	ELEL5	*Elymus elymoides*	0–16	–
	prairie Junegrass	KOMA	*Koeleria macrantha*	0–16	–
Forb					
7	**Perennial, dominant**			48–96	
	milkvetch	ASTRA	*Astragalus*	16–32	–
	buckwheat	ERIOG	*Eriogonum*	16–32	–
	lupine	LUPIN	*Lupinus*	16–32	–
9	**Other perennial forbs, all**			16–80	
	common yarrow	ACMI2	*Achillea millefolium*	0–16	–
	agoseris	AGOSE	*Agoseris*	0–16	–
	onion	ALLIU	*Allium*	0–16	–
	Indian paintbrush	CASTI2	*Castilleja*	0–16	–
	tapertip hawksbeard	CRAC2	*Crepis acuminata*	0–16	–
	larkspur	DELPH	*Delphinium*	0–16	–
	fleabane	ERIGE2	*Erigeron*	0–16	–
	waterleaf	HYDRO4	*Hydrophyllum*	0–16	–
	western stoneseed	LIRU4	*Lithospermum ruderale*	0–16	–
	woodland-star	LITHO2	*Lithophragma*	0–16	–
	desertparsley	LOMAT	*Lomatium*	0–16	–
	bluebells	MERTE	*Mertensia*	0–16	–
	Brown's peony	PABR	*Paeonia brownii*	0–16	–
	beardtongue	PENST	*Penstemon*	0–16	–
	phlox	PHLOX	*Phlox*	0–16	–
	ragwort	SENEC	*Senecio*	0–16	–
Shrub/Vine					
11	**Deciduous, dominant**			240–320	
	antelope bitterbrush	PUTR2	*Purshia tridentata*	240–320	–
12	**Evergreen, subdominant**			48–128	
	mountain big sagebrush	ARTRV	*Artemisia tridentata ssp. vaseyana*	48–128	–
14	**Deciduous, sub-dominant**			64–192	
	common snowberry	SYAL	*Symphoricarpos albus*	16–80	–
	wild crab apple	PERA4	*Peraphyllum ramosissimum*	16–48	–
	wax currant	RICE	*Ribes cereum*	16–32	–

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	curl-leaf mountain mahogany	CELE3	*Cercocarpus ledifolius*	16–32	–
15	**Other shrubs**			32–160	
	Saskatoon serviceberry	AMAL2	*Amelanchier alnifolia*	0–32	–
	basin big sagebrush	ARTRT	*Artemisia tridentata ssp. tridentata*	0–32	–
	rabbitbrush	CHRYS9	*Chrysothamnus*	0–32	–
	chokecherry	PRVI	*Prunus virginiana*	0–32	–
	rose	ROSA5	*Rosa*	0–32	–
Tree					
16	**Evergreen trees**			16–48	
	western juniper	JUOC	*Juniperus occidentalis*	0–32	–
	ponderosa pine	PIPO	*Pinus ponderosa*	16–32	–

Animal community

Livestock Grazing:

This site is suited to use by cattle, sheep, and horses during the summer and fall under a planned grazing system. Use should be postponed until the soils are firm enough to avoid trampling damage and soil compaction.

Native Wildlife Associated with the Reference Plant Community:

Mule deer
Elk
Hawks
Rodents
Songbirds

This site offers cover and food for mule deer, elk, rodents, and a variety of birds and their associated predators. Antelope bitterbrush provides valuable fall winter forage.

Hydrological functions

The soils are in hydrologic groups B and C. The soils of this site have medium runoff potential.

Wood products

This site is susceptible to increase in western juniper. Where this has occured the site will yield firewood, fence posts, and specialty products.

Other information

Increase in western juniper and the subsequent competition for moisture will lead to a reduction of soil cover and accelerated soil loss. Improving infiltration and permeability, and reducing runoff should be the immediate goal of juniper control.

Contributors

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Approval

Kirt Walstad, 4/10/2025

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)	Jeff Repp and Bruce Franssen
Contact for lead author	NRCS Oregon State Rangeland Management Specialist
Date	04/23/2003
Approved by	Kirt Walstad
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** None to very few on steeper slopes

2. **Presence of water flow patterns:** None to very few on steeper slopes

3. **Number and height of erosional pedestals or terracettes:** None to very few on steeper slopes (terracettes)

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 0-5%

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

6. **Extent of wind scoured, blowouts and/or depositional areas:** None

7. **Amount of litter movement (describe size and distance expected to travel):** Fine - limited movement

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Moderately resistant to erosion: aggregate stability = 3-5

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Weak very fine to moderate medium granular structure, dry color value 4-5, 7-13 inches thick; moderate OM (2-8%)

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Significant ground cover (80-90%) and gentle to very steep slopes (12-60%) effectively limit rainfall impact and overland flow

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** None

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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: Perennial, cool-season, deep-rooted, bunchgrasses

    Sub-dominant: Deciduous shrubs

    Other: Other shrubs > other grasses > forbs

    Additional:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Normal decadence and mortality expected

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

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 1600 lbs/ac

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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:** Perennial brush species will increase with deterioration of plant community. Western Juniper readily invades the site. Cheatgrass and Medusahead invade sites that have lost deep rooted perennial grass functional groups

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17. **Perennial plant reproductive capability:** All species should be capable of reproducing annually

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