

# Ecological site R010XB028OR JD Shrubby Mountain 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

R010XB046OR	<b>JD Shrubby Mountain South 12-16 PZ</b> Steeper south slopes, lower production, dominated by bluebunch wheatgrass
R010XB071OR	<b>JD Shrubby Mountain North 12-16 PZ</b> Steeper north slopes, more shrubs (including wild crab apple)

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Purshia tridentata</i> (2) <i>Artemisia tridentata ssp. vaseyana</i>
Herbaceous	(1) <i>Festuca idahoensis</i>

## Physiographic features

This site occurs on terraces, tablelands, and mountain plateaus. Slopes range from 0 to 12 percent. Elevations range from 4,000 to 6,000 feet.

Table 2. Representative physiographic features

Landforms	(1) Terrace (2) Mountain (3) Plateau
Flooding frequency	None
Ponding frequency	None
Elevation	1,219–1,829 m
Slope	0–12%
Water table depth	152 cm
Aspect	Aspect is not a significant factor

## 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 43 degrees F. Temperature extremes range from 90 to -30 degrees F. The frost-free period ranges from 40 to 80 days. The optimum period for plant growth is from April through July.

**Table 3. Representative climatic features**

Frost-free period (average)	80 days
Freeze-free period (average)	40 days
Precipitation total (average)	406 mm

## 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 cobbly loam to gravelly loam about 7 inches thick. The subsoil is a very shaly loam to a clay loam about 28 inches thick. Depth to shale or highly fractured bedrock ranges from 10 to 40 inches. Permeability is slow to moderate. The available water holding capacity is about 1.4 to 4 inches for the profile. The potential for erosion is moderate to severe.

**Table 4. Representative soil features**

Surface texture	(1) Very cobbly loam (2) Very stony loam (3) Gravelly loam
Family particle size	(1) Clayey
Drainage class	Well drained
Permeability class	Moderate to moderately slow
Soil depth	25–102 cm
Surface fragment cover ≤3"	11–20%
Surface fragment cover >3"	4–27%
Available water capacity (0-101.6cm)	3.56–10.41 cm
Calcium carbonate equivalent (0-101.6cm)	0%

Electrical conductivity (0-101.6cm)	0 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0
Soil reaction (1:1 water) (0-101.6cm)	6.1–7.8
Subsurface fragment volume >3" (Depth not specified)	22–34%

## Ecological dynamics

### Range in Characteristics:

Bluebunch wheatgrass increases on southerly facing slopes. Thurber needlegrass will increase with more coarse surface texture.

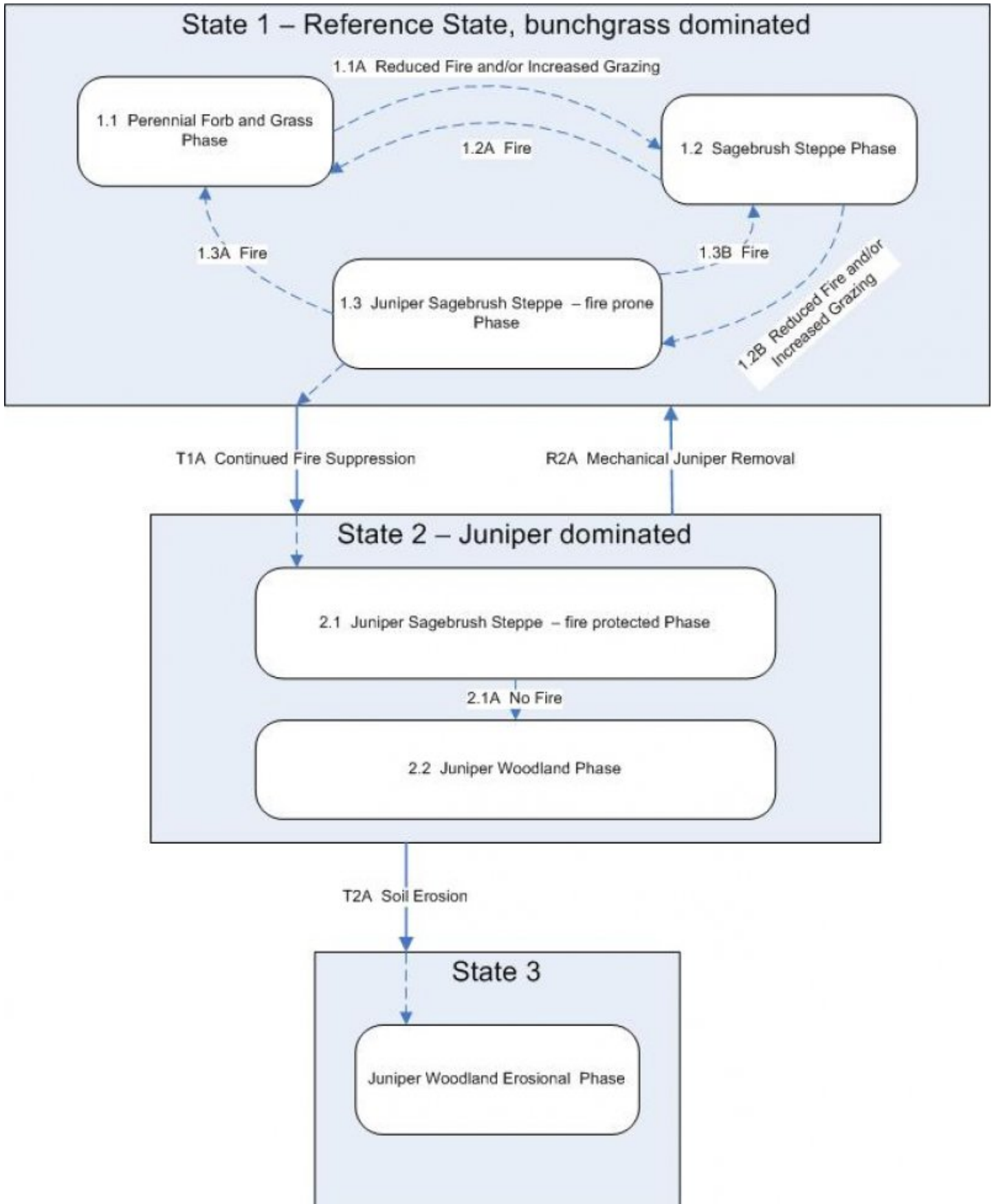
### Response to Disturbance:

Overgrazing may cause a decrease in deep-rooted perennial bunchgrass, primarily Idaho fescue and bluebunch wheatgrass. Unpalatable species such as sagebrush and juniper increase and the percentage of squirreltail may also increase. As grass cover declines the potential for weed invasion and expansion of juniper increases. 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 this site 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 on north facing aspects 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 and warmer non-aspect sites 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 Plant Community**

**Community 1.1**  
**Reference Plant Community**

The potential native plant community is dominated by mountain big sagebrush, antelope bitterbrush, and Idaho fescue. Basin big sagebrush, bluebunch wheatgrass, basin wildrye, and Thurber needlesgrass are prominent in the stand. Vegetative composition of the community by air-dry weight is approximately 65 percent grasses, 10 percent forbs, and 25 percent shrubs and trees. Foliar cover of ponderosa pine ranges to a maximum of 5 percent with a minimum 10 percent antelope bitterbrush. Approximate ground cover is 60-70 percent (basal and crown).

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	729	1093	1457
Shrub/Vine	258	387	516
Forb	112	168	224
Tree	22	34	45
<b>Total</b>	<b>1121</b>	<b>1682</b>	<b>2242</b>

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 (Kg/Hectare)	Foliar Cover (%)
<b>Grass/Grasslike</b>					
1	<b>Perennial, deep-rooted, dominant</b>			841–1177	
	Idaho fescue	FEID	<i>Festuca idahoensis</i>	841–1177	–
2	<b>Perennial, deep-rooted, sub-dominant</b>			151–471	
	bluebunch wheatgrass	PSSP6	<i>Pseudoroegneria spicata</i>	84–252	–
	Thurber's needlegrass	ACTH7	<i>Achnatherum thurberianum</i>	34–135	–
	basin wildrye	LECI4	<i>Leymus cinereus</i>	17–50	–
	California brome	BRCA5	<i>Bromus carinatus</i>	17–34	–
4	<b>Perennial, shallow-rooted</b>			34–84	
	bluegrass	POA	<i>Poa</i>	34–84	–
5	<b>Other perennial grasses</b>			34–50	
	sedge	CAREX	<i>Carex</i>	0–34	–
	squirreltail	ELEL5	<i>Elymus elymoides</i>	0–34	–
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	0–34	–
	Sandberg bluegrass	POSE	<i>Poa secunda</i>	0–34	–
<b>Forb</b>					
7	<b>Perennial, dominant</b>			50–101	
	arrowleaf balsamroot	BASA3	<i>Balsamorhiza sagittata</i>	17–34	–
	buckwheat	ERIOG	<i>Eriogonum</i>	17–34	–
	lupine	LUPIN	<i>Lupinus</i>	17–34	–
9	<b>Other perennial forbs</b>			17–84	
	common yarrow	ACMI2	<i>Achillea millefolium</i>	0–17	–

	pussytoes	ANIEN	<i>Antennaria</i>	0-17	-
	Indian paintbrush	CASTI2	<i>Castilleja</i>	0-17	-
	tapertip hawkbeard	CRAC2	<i>Crepis acuminata</i>	0-17	-
	fleabane	ERIGE2	<i>Erigeron</i>	0-17	-
	waterleaf	HYDRO4	<i>Hydrophyllum</i>	0-17	-
	stoneseed	LITHO3	<i>Lithospermum</i>	0-17	-
	desertparsley	LOMAT	<i>Lomatium</i>	0-17	-
	bluebells	MERTE	<i>Mertensia</i>	0-17	-
	phlox	PHLOX	<i>Phlox</i>	0-17	-
	buttercup	RANUN	<i>Ranunculus</i>	0-17	-
	ragwort	SENEC	<i>Senecio</i>	0-17	-
	deathcamas	ZIGAD	<i>Zigadenus</i>	0-17	-
<b>Shrub/Vine</b>					
13	<b>Deciduous, dominant</b>			252-336	
	antelope bitterbrush	PUTR2	<i>Purshia tridentata</i>	252-336	-
14	<b>Evergreen, subdominant</b>			50-135	
	mountain big sagebrush	ARTRV	<i>Artemisia tridentata ssp. vaseyana</i>	50-135	-
15	<b>Other shrubs</b>			34-84	
	Saskatoon serviceberry	AMAL2	<i>Amelanchier alnifolia</i>	0-34	-
	basin big sagebrush	ARTRT	<i>Artemisia tridentata ssp. tridentata</i>	0-34	-
	curl-leaf mountain mahogany	CELE3	<i>Cercocarpus ledifolius</i>	0-34	-
	rabbitbrush	CHRY9	<i>Chrysothamnus</i>	0-34	-
	granite prickly phlox	LIPU11	<i>Linanthus pungens</i>	0-34	-
	currant	RIBES	<i>Ribes</i>	0-34	-
	common snowberry	SYAL	<i>Symphoricarpos albus</i>	0-34	-
	horsebrush	TETRA3	<i>Tetradymia</i>	0-34	-
<b>Tree</b>					
16	<b>Evergreen trees</b>			17-50	
	western juniper	JUOC	<i>Juniperus occidentalis</i>	0-34	-
	ponderosa pine	PIPO	<i>Pinus ponderosa</i>	17-34	-

## Animal community

### Livestock Grazing:

This site is suited to use by cattle, horses, and sheep in late spring, 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 Potential Climax Community:

Mule deer  
 Elk  
 Songbirds  
 Rodents  
 Pronghorn antelope  
 Sage grouse

## Hawks

This site may support mule deer, pronghorn antelope, sage grouse, rodents, and a variety of birds. Antelope bitterbrush provides important winter browse for mule deer and elk.

## Hydrological functions

The soils are in hydrologic groups B and C. The soils of this site have moderately low to moderately high runoff potential.

## Wood products

This site is susceptible to increase in western juniper. Where this has occurred, the site will yield fence posts, firewood, and other 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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## 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, Bruce Franssen
Contact for lead author	Oregon State Rangeland Management Specialist
Date	04/23/2003
Approved by	Bob Gillaspy
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

## Indicators

1. **Number and extent of rills:** None to some
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2. **Presence of water flow patterns:** None to some
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3. **Number and height of erosional pedestals or terracettes:** None to some

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 5-15%
- 
5. **Number of gullies and erosion associated with gullies:** None
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6. **Extent of wind scoured, blowouts and/or depositional areas:** None
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7. **Amount of litter movement (describe size and distance expected to travel):** Fine - limited movement
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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 = 4-6
- 
9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** weak medium platy to subangular blocky structure, dry color value 4-5, 2-9 inches thick; moderate (1-4 percent) soil organic matter
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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Moderate ground cover (60-70%) and gentle slopes (0-12%) effectively limit rainfall impact and overland flow
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11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** None
- 
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 shrub
- Other: Forbs, other grasses
- Additional:
- 
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):** 1500 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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