

# Ecological site R010XB082OR JD Shrubby Claypan 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.

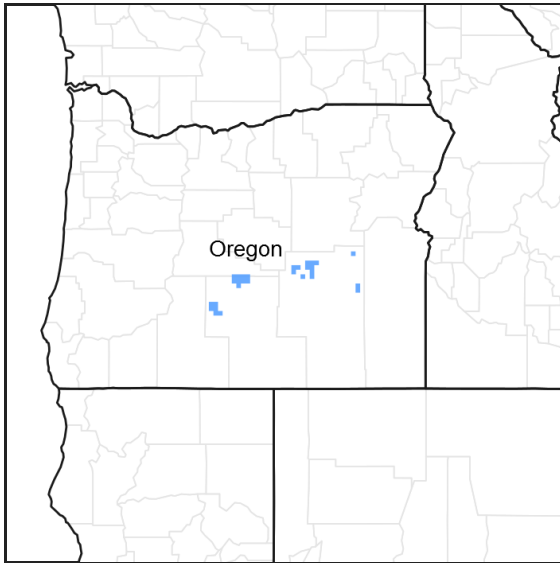


Figure 1. Mapped extent

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.

## Similar sites

R010XB080OR	<b>JD Claypan 12-16 PZ</b> substratum not highly fractured, lower production, little to no antelope bitterbrush
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Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Purshia tridentata</i> (2) <i>Artemisia arbuscula</i>
Herbaceous	(1) <i>Festuca idahoensis</i> (2) <i>Pseudoroegneria spicata</i>

## Physiographic features

This site occurs on terraces, tablelands, and mountain plateaus. Slopes range from 2 to 12 percent. Elevations range from 4000 to 5700 feet.

Table 2. Representative physiographic features

Landforms	(1) Plateau (2) Hill (3) Terrace
Flooding frequency	None
Ponding frequency	None
Elevation	1,219–1,737 m
Slope	2–12%
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 with a mean annual air temperature of 45 degrees F. Temperature extremes range from 90 to -30 degrees F. The frost-free period ranges from 30 to 90 days. The optimum period for plant growth is from April through June.

**Table 3. Representative climatic features**

Frost-free period (average)	90 days
Freeze-free period (average)	40 days
Precipitation total (average)	406 mm

## Influencing water features

### Soil features

The soils of this site are shallow with a strongly developed clay pan over bedrock. The surface layer is a loam to clay loam 5 to 10 inches thick. Variable amounts of coarse fragments are present. An abrupt boundary occurs at the interface of the surface and subsoil. The subsoil is clay. Permeability is moderately slow to slow in the surface layer and slow to very slow in the subsoil. The available water holding capacity (AWC) is 2 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) Ashy sandy loam
Family particle size	(1) Clayey
Drainage class	Well drained
Permeability class	Very slow to slow
Soil depth	25–51 cm
Surface fragment cover <=3"	10–13%
Surface fragment cover >3"	2–32%
Available water capacity (0-101.6cm)	5.08–11.18 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)	4–22%

## Ecological dynamics

Range in Characteristics:

Antelope bitterbrush increases with fracturing of the substratum and precipitation. One-spike oatgrass increases on late-winter ponded areas and as the surface depth decreases. Sandberg bluegrass increases at the lower end of the precipitation zone. Bluebunch wheatgrass increases as the aspect varies to the south. Thurber needlegrass increases with gravelly surfaces. Production is directly related to surface soil depth, decreasing as the surface becomes more shallow.

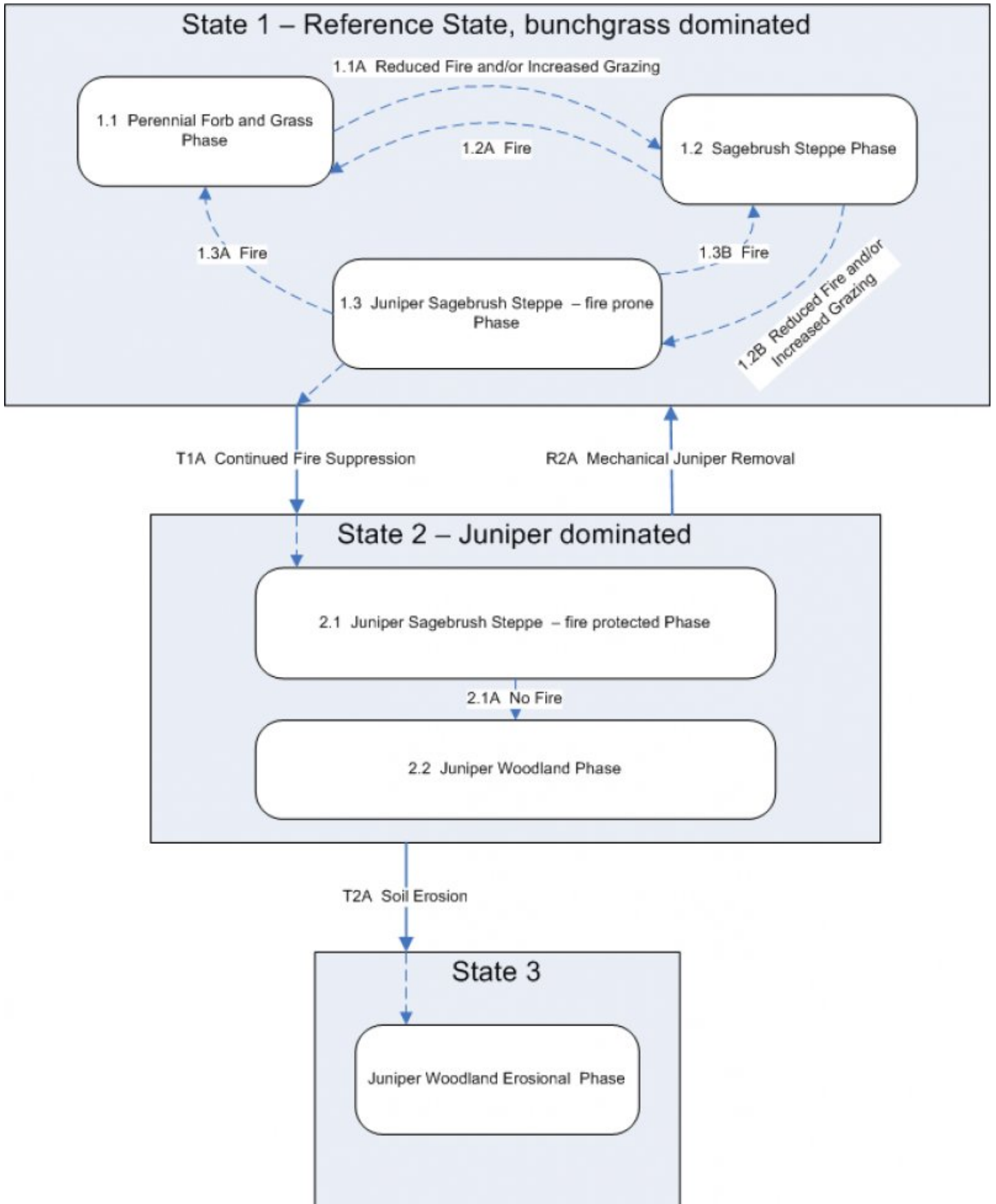
Response to Disturbance:

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 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 warmer 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 antelope bitterbrush, low sagebrush, Idaho fescue, and bluebunch wheatgrass. Sandberg bluegrass and onespoke danthonia are common. A variety of forbs including buckwheat and phlox are common. The vegetative composition of the community is approximately 65 percent grasses, 5 percent forbs, and 30 percent shrubs. Approximate ground cover is 50-60 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	437	656	874
Shrub/Vine	202	297	392
Forb	34	50	67
Tree	–	6	11
<b>Total</b>	<b>673</b>	<b>1009</b>	<b>1344</b>

**Figure 5. Plant community growth curve (percent production by month).  
OR4201, B10 JD Very Shallow RPC. JD Very Shallow RPC Growth Curve.**

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	5	15	30	35	5	0	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>			303–404	
	Idaho fescue	FEID	<i>Festuca idahoensis</i>	303–404	–
2	<b>Perennial, deep-rooted, sub-dominant</b>			202–303	
	bluebunch wheatgrass	PSSP6	<i>Pseudoroegneria spicata</i>	202–303	–
3	<b>Perennial, deep-rooted, sub-dominant</b>			30–81	
	onespike danthonia	DAUN	<i>Danthonia unispicata</i>	30–81	–
4	<b>Perennial, shallow-rooted</b>			20–50	
	Sandberg bluegrass	POSE	<i>Poa secunda</i>	20–50	–
5	<b>Perennial, deep-rooted, sub-dominant</b>			20–40	
	squirreltail	ELEL5	<i>Elymus elymoides</i>	10–20	–
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	10–20	–
6	<b>Other perennial grasses</b>			0–40	
	Thurber's needlegrass	ACTH7	<i>Achnatherum thurberianum</i>	0–20	–
	threadleaf sedge	CAFI	<i>Carex filifolia</i>	0–20	–
<b>Forb</b>					
7	<b>Perennial, dominant</b>			20–40	
	buckwheat	ERIOG	<i>Eriogonum</i>	10–20	–
	phlox	PHLOX	<i>Phlox</i>	10–20	–
9	<b>Other perennial forbs</b>			0–30	
	common yarrow	ACMI2	<i>Achillea millefolium</i>	0–10	–
	pussytoes	ANTEN	<i>Antennaria</i>	0–10	–
	serrate balsamroot	BASE2	<i>Balsamorhiza serrata</i>	0–10	–
	Indian paintbrush	CASTI2	<i>Castilleja</i>	0–10	–
	bushy bird's beak	CORA5	<i>Cordylanthus ramosus</i>	0–10	–
	fleabane	ERIGE2	<i>Erigeron</i>	0–10	–
	desertparsley	LOMAT	<i>Lomatium</i>	0–10	–
	ragwort	SENEC	<i>Senecio</i>	0–10	–
	largehead clover	TRMA3	<i>Trifolium macrocephalum</i>	0–10	–
<b>Shrub/Vine</b>					
13	<b>Deciduous, dominant</b>			151–202	
	antelope bitterbrush	PUTR2	<i>Purshia tridentata</i>	151–202	–
14	<b>Evergreen, subdominant</b>			101–151	
	little sagebrush	ARARA	<i>Artemisia arbuscula ssp. arbuscula</i>	101–151	–
	little sagebrush	ARARL	<i>Artemisia arbuscula ssp. longiloba</i>	101–151	–
15	<b>Other shrubs</b>			0–10	
	green rabbitbrush	ERTE18	<i>Ericameria teretifolia</i>	0–10	–
<b>Tree</b>					
16	<b>Evergreen trees</b>			0–10	
	western juniper	JUOC	<i>Juniperus occidentalis</i>	0–10	–

## Animal community

## Livestock Grazing:

This site is suited to use by cattle, sheep, and horses 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:

Deer  
Antelope  
Elk  
Hawks  
Songbirds  
Rodents

This site will offer food and cover for mule deer, antelope, elk, rodents, and a variety of birds and their associated predators. It is an important late fall, winter, and spring use area for big game.

## Hydrological functions

The soils are in hydrologic group D. The soils of this site have 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 specialty products.

## Other information

The soils in this site have good water holding capacities providing late season water for plant growth and slow water releases to streams. Increase in western juniper and the subsequent competition for moisture will lead to a reduction of available forage. Overgrazing can easily reduce ground cover and accelerate soil loss. Improving infiltration and permeability, and reducing runoff should be the immediate goal of juniper control. When incised channels are present, rehabilitation will markedly improve production, reduce downstream sedimentation and restore good hydrologic characteristics. On altered sites the reintroduction of basin wildrye may be needed to fully restore the site potential.

## 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 and Bruce Franssen
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Date	04/24/2003
Approved by	Bob Gillaspy

Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

## Indicators

1. **Number and extent of rills:** None  
\_\_\_\_\_
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):** 10-15%  
\_\_\_\_\_
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):** Moderate medium granular structure to strong thick platy structure parting to weak thin platy structure, dry color value 5-6, 6 to 10 inches thick; moderate organic matter (1-4% SOM)  
\_\_\_\_\_
10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Moderate ground cover (50-60%) and gentle slopes (2-12%) 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  
\_\_\_\_\_
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: Deep-rooted, perennial, cool-season bunchgrasses

Sub-dominant: Deciduous shrub > low evergreen shrub

Other: Other perennial grasses > perennial forbs > other shrubs and trees

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):** Favorable: 1200, Normal: 900, Unfavorable: 600 lbs/acre/year
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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:** 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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