USDA Natural Resources
Conservation Service

Ecological site R010XA009OR
Juniper Shrubby Pumice Flat 10-12 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.

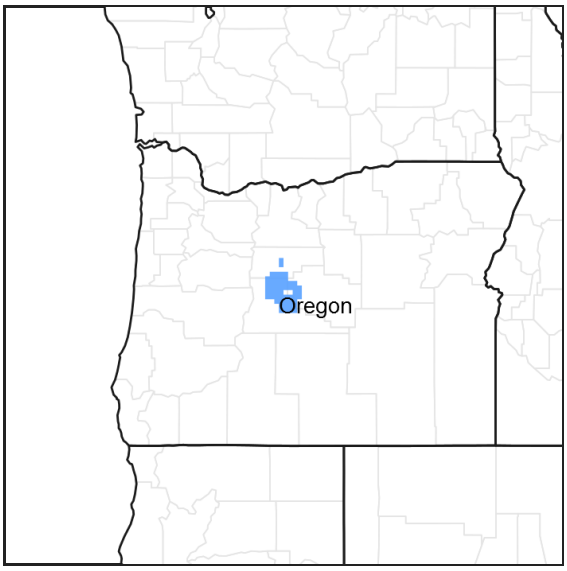


Figure 1. Mapped extent

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

R010XA019OR	**Shrubby Loam 8-12 PZ** Droughty 8-12 PZ, lower precipitation and production. Domnated by bluebunch wheatgrass.
R010XA023OR	**Juniper Lava Shrubby Blisters 10-12 PZ** Lava Blisters 10-12 PZ, lower production due to shallower site.

Similar sites

R010XA027OR	**Juniper Pumice Flat 8-10 PZ** Pumice Flat 8-10 PZ, lower precipitation.

Table 1. Dominant plant species

Tree	(1) *Juniperus occidentalis*
Shrub	(1) *Purshia tridentata* (2) *Artemisia tridentata var. vaseyana*
Herbaceous	(1) *Festuca idahoensis* (2) *Hesperostipa comata*

Physiographic features

This site occurs on nearly level to gentle uplands.

Table 2. Representative physiographic features

Landforms	(1) Lava plain (2) Outwash plain (3) Stream terrace
Flooding frequency	None
Ponding frequency	None
Elevation	762–1,219 m
Slope	0–20%
Aspect	Aspect is not a significant factor

Climatic features

The annual precipitation ranges from 10 to 12 inches which occurs mainly between the months of October and June, mostly in the form of rain and snow. The soil temperature regime is mesic. The average annual air temperature is 48 degrees F. with extreme temperatures ranging from -27 to 105 degrees F. The frost free period is 40 to 90 days. The optimum period for plant growth is from late March through June.

Table 3. Representative climatic features

Frost-free period (average)	90 days
Freeze-free period (average)	130 days
Precipitation total (average)	305 mm

Influencing water features

Soil features

The soils of this site are typically moderately deep to deep, somewhat excessively drained and coarse textured. They are generally formed in volcanic ash. Permeability is rapid and the available water holding capacity is 3 to 6 inches for the profile. The potential for water or wind erosion is slight to moderate, depending on slope.

Table 4. Representative soil features

Surface texture	(1) Ashy sandy loam (2) Loamy sand
Family particle size	(1) Sandy
Drainage class	Well drained to somewhat excessively drained
Permeability class	Moderately rapid to rapid
Soil depth	51–152 cm
Surface fragment cover <=3"	0–10%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	6.35–15.24 cm
Calcium carbonate equivalent (0-101.6cm)	0%

Electrical conductivity (0-101.6cm)	0–2 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0
Soil reaction (1:1 water) (0-101.6cm)	6.6–7.8
Subsurface fragment volume <=3" (Depth not specified)	0–35%
Subsurface fragment volume >3" (Depth not specified)	0–5%

Ecological dynamics

For most of this site, Idaho fescue (FEID) is concentrated beneath or near the canopy of juniper trees (JUOC) where it dominates the ground cover. Needle and thread (HECOC8) (plus most of the other grasses) are concentrated in the interspaces between trees where it dominates the ground cover. However, when this site is adjacent to the pine forest boundary, needle and thread disappears and Idaho fescue dominates the interspaces as well.

Disturbance Response

Three primary disturbances were identified for this group: grazing, tree cutting and the infrequent small area fire.

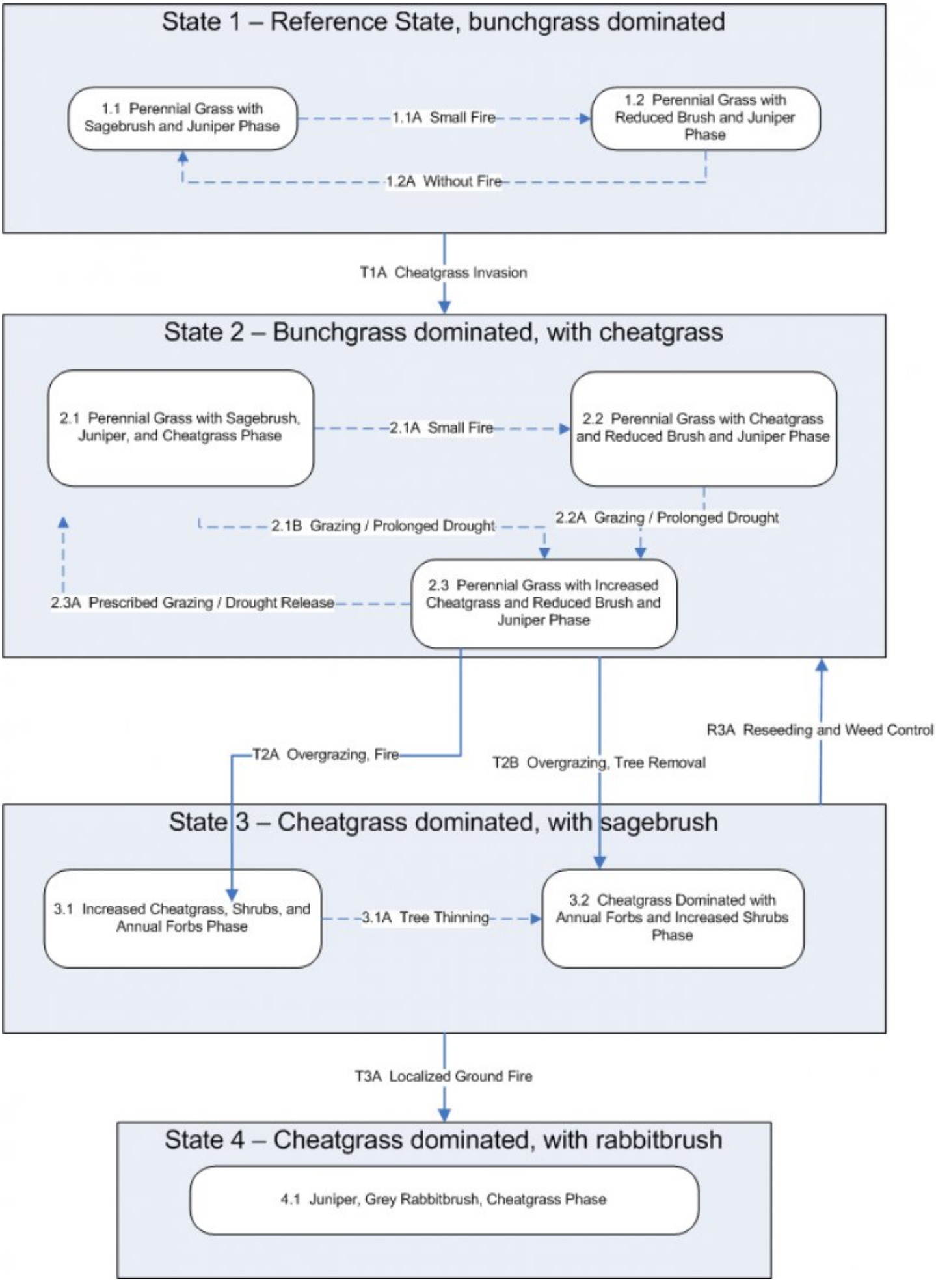
Inappropriate grazing causes a reduction in Idaho fescue, needle and thread, Indian ricegrass (ACHY), and Thurber needlegrass (ACTH7), which encourages rubber rabbitbrush ERNA10), granite prickly phlox (LIPU), squirreltail (ELEL5), and weeds. Idaho fescue may remain in the community under the north side canopy of juniper trees and cheatgrass (BRTE), if present, will increase on all other aspects under the canopy. Interspaces are normally sparse, however with overgrazing granite prickly phlox increases and grasses decline. Squirreltail may increase initially as needle and thread and Idaho fescue decline, however with continued overgrazing this species will also decline. Eventually deep rooted perennial bunchgrasses (DRPBG) are eliminated. Cheatgrass becomes dominant along with rubber rabbitbrush. Ground fire potential increases with increasing cheatgrass.

Juniper clearing is detrimental to Idaho fescue where fescue does not grow in the interspaces, since it is dependent on the overstory effects for its survival. Cutting of juniper (JUOC) leads to an increase in rubber rabbitbrush and an increase in cheatgrass with or without grazing. The addition of inappropriate grazing would lead to a decline in the other deep-rooted perennial bunchgrasses and an increase in annuals and granite prickly phlox.

Fire was infrequent in the historical community and limited to single tree or small area events (Miller, R. pers. comm. 2006). Fire was responsible for the maintenance of a grass or shrub steppe savanna. With the reduction in fire frequency trees invade rapidly reducing the understory shrub community. With juniper cutting and/or improper grazing cheatgrass will dominate the understory and the probability of ground fire increases, however without ladder fuels the fire would be small in extent. Burning reduces sagebrush (ARTRV), bitterbrush (PUTR2), and juniper while increasing cover of rabbitbrush. Fire may allow cheatgrass and other annuals to invade this site.

Inappropriate grazing, juniper thinning and fire can lead to an increase in cheatgrass particularly on the south side of the juniper canopies.

State and transition model


State 1 – Reference State, bunchgrass dominated
1.1 Perennial Grass with Sagebrush and Juniper Phase
1.1A Small Fire
1.2 Perennial Grass with Reduced Brush and Juniper Phase
1.2A Without Fire
T1A Cheatgrass Invasion
State 2 – Bunchgrass dominated, with cheatgrass
2.1 Perennial Grass with Sagebrush, Juniper, and Cheatgrass Phase
2.1A Small Fire
2.2 Perennial Grass with Cheatgrass and Reduced Brush and Juniper Phase
2.1B Grazing / Prolonged Drought
2.2A Grazing / Prolonged Drought
2.3A Prescribed Grazing / Drought Release
2.3 Perennial Grass with Increased Cheatgrass and Reduced Brush and Juniper Phase
R3A Reseeding and Weed Control
T2A Overgrazing, Fire
T2B Overgrazing, Tree Removal
State 3 – Cheatgrass dominated, with sagebrush
3.1 Increased Cheatgrass, Shrubs, and Annual Forbs Phase
3.1A Tree Thinning
3.2 Cheatgrass Dominated with Annual Forbs and Increased Shrubs Phase
T3A Localized Ground Fire
State 4 – Cheatgrass dominated, with rabbitbrush
4.1 Juniper, Grey Rabbitbrush, Cheatgrass Phase

State 1
Reference Plant Community

Community 1.1
Reference Plant Community

The potential native plant community is dominated by western juniper, mountain big sagebrush, bitterbrush, Idaho fescue, needle and thread. Vegetative composition is approximately 70% grasses, 5% forbs, and 25% shrubs/trees.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	549	706	863
Shrub/Vine	157	202	247
Tree	39	50	62
Forb	39	50	62
Total	**784**	**1008**	**1234**

Figure 5. Plant community growth curve (percent production by month). OR4011, B10A Mesic, Mid Elev., N/A, Good Condition. RPC Growth Curve (Pumice Flats).

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	2	10	58	28	2	0	0	0	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 (%)
Grass/Grasslike					
1	**Perennial, bunch-grass, deep-rooted**			235–370	
	Idaho fescue	FEID	*Festuca idahoensis*	235–370	–
2	**Perennial, bunch-grass, deep-rooted**			157–247	
	needle and thread	HECOC8	*Hesperostipa comata ssp. comata*	157–247	–
3	**Perennial, bunch-grass, deep-rooted**			133–210	
	Thurber's needlegrass	ACTH7	*Achnatherum thurberianum*	39–62	–
	western needlegrass	ACOC3	*Achnatherum occidentale*	31–49	–
	Indian ricegrass	ACHY	*Achnatherum hymenoides*	24–37	–
	thickspike wheatgrass	ELLA3	*Elymus lanceolatus*	24–37	–
	Ross' sedge	CARO5	*Carex rossii*	16–25	–
5	**Other perennial grasses**			24–37	
	squirreltail	ELEL5	*Elymus elymoides*	0–12	–
	Sandberg bluegrass	POSE	*Poa secunda*	0–12	–
	bluebunch wheatgrass	PSSP6	*Pseudoroegneria spicata*	0–12	–
Forb					
9	**Other perennial forbs**			39–62	
	common yarrow	ACMI2	*Achillea millefolium*	0–25	–
	pussytoes	ANTEN	*Antennaria*	0–25	–
	buckwheat	ERIOG	*Eriogonum*	0–25	–
	starlily	LEUCO	*Leucocrinum*	0–25	–
	desertparsley	LOMAT	*Lomatium*	0–25	–
	lupine	LUPIN	*Lupinus*	0–25	–
	phacelia	PHACE	*Phacelia*	0–25	–
	phlox	PHLOX	*Phlox*	0–25	–
Shrub/Vine					
11	**Deciduous, dominant**			78–123	
	antelope bitterbrush	PUTR2	*Purshia tridentata*	78–123	–
12	**Evergreen, dominant**			39–62	
	mountain big sagebrush	ARTRV	*Artemisia tridentata ssp. vaseyana*	39–62	–
15	**Other shrubs**			39–62	
	yellow rabbitbrush	CHVI8	*Chrysothamnus viscidiflorus*	0–25	–
	slender buckwheat	ERMI4	*Eriogonum microthecum*	0–25	–
	rubber rabbitbrush	ERNA10	*Ericameria nauseosa*	0–25	–
	granite prickly phlox	LIPU11	*Linanthus pungens*	0–25	–
	desert gooseberry	RIVE	*Ribes velutinum*	0–25	–
Tree					
16	**Evergreen trees**			39–62	
	western juniper	JUOC	*Juniperus occidentalis*	39–62	–

Animal community

Mule deer use this site as winter range. This site is suited to use by livestock in all seasons under a planned grazing system.

Hydrological functions

The soils of this site have high infiltration rates and low runoff potential.

Wood products

Fence posts, firewood, and speciality products.

Other products

Natural stock watering sources are not normally available on this site.

Other information

For range seedings, recommended species are crested wheatgrass, Siberian wheatgrass, thickspike wheatgrass, Indian ricegrass, and sheep fescue.

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.
Contact for lead author	State Rangeland Management Specialist for NRCS in Oregon.
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

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

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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):** 15-30%

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

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

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 = 4-5

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Weak to moderate very fine granular structure, dry color value 4-5, 7-20 inches thick; low SOM (1-2%)

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Significant ground cover (65-80%) and level to gently rolling slopes (0-20%) significantly 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 bunch-grasses

    Sub-dominant: Deciduous shrubs > evergreen shrubs

    Other: perennial forbs

    Additional:

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

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: 1100, Normal: 900, Unfavorable: 700 lbs/acre/year at high RSI

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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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