

Ecological site R010XA002OR

Juniper Shrubby Pumice Hills

8-10 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.

Associated sites

R010XA007OR	Juniper Pumice South 9-12 PZ SOUTH 10-12 PZ
R010XA083OR	Juniper Shrubby North 9-12 PZ SANDY NORTH 10-12 PZ
R010XA001OR	Loamy 8-10 PZ DROUGHTY LOAM 8-10 PZ
R010XA018OR	Juniper Shrubby Loam 10-12 PZ LOAMY 10-12 PZ

Similar sites

R010XA027OR	Juniper Pumice Flat 8-10 PZ PUMICE FLAT 8-10 PZ
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Table 1. Dominant plant species

Tree	(1) <i>Juniperus occidentalis</i>
Shrub	(1) <i>Artemisia tridentata</i> ssp. <i>tridentata</i> (2) <i>Purshia tridentata</i>
Herbaceous	(1) <i>Hesperostipa comata</i> (2) <i>Oryzopsis hymenoides</i>

Physiographic features

This site occurs on flat to gentle slopes and swales in uplands; also on dry basins, drainage terraces, fans, or slopes adjacent to bottomlands.

Table 2. Representative physiographic features

Landforms	(1) Swale (2) Terrace (3) Fan
Flooding frequency	None
Ponding frequency	None
Elevation	610 – 1,070 m
Slope	0 – 30 %
Aspect	Aspect is not a significant factor

Climatic features

The annual precipitation typically ranges from 8 to 10 inches, but occasionally up to 12 inches. Most precipitation occurs between November and early 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 freeze free period is 90 to 120 days. The optimum period for plant growth is from early March through June.

Table 3 Representative climatic features

Frost-free period (average)	120 days
Freeze-free period (average)	120 days
Precipitation total (average)	250 mm

Influencing water features

Soil features

The soils of this site are moderately deep to deep, well or excessively drained, and have sandy textured surfaces. Subsoils are sandy and sometimes gravelly. They are generally formed in isolated deposits of volcanic ash. Permeability is moderately rapid and the available water holding capacity is 4 to 6.7 inches for the profile. The potential for wind erosion is high.

Table 4. Representative soil features

Surface texture	(1) Very gravelly sandy loam (2) Ashy sandy loam (3) Loam
Family particle size	(1) Sandy
Drainage class	Well drained to somewhat excessively drained
Permeability class	Moderately rapid to moderately slow
Soil depth	50 – 150 cm
Surface fragment cover <=3"	0 – 40 %
Surface fragment cover >3"	Not specified
Available water capacity (0-101.6cm)	10.16 – 17.02 cm
Calcium carbonate equivalent (0-101.6cm)	Not specified
Electrical conductivity (0-101.6cm)	Not specified
Sodium adsorption ratio (0-101.6cm)	Not specified
Soil reaction (1:1 water) (0-101.6cm)	6.1 – 7.8
Subsurface fragment volume <=3" (Depth not specified)	0 – 20 %

Subsurface fragment volume >3" (Depth not specified)	0 – 10 %
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Ecological dynamics

The existence of the reference state today is rare or not at all, therefore it is presented in this model as a reminder of what once was. Community changes were likely rare, spatially dispersed, and precipitated by small or single tree fires.

The ecological function of State 2 has not changed from that of the reference state, however the resiliency of the state has been reduced by the presence of cheatgrass.

Burning reduces the cover of sagebrush, bitterbrush, and juniper.

Increasers and invaders include cheatgrass, annual fescue, collinsia, fiddleneck, cryptantha, hemizonia, mustard, pepperweed, snakeweed, and rubber rabbitbrush.

The percent composition for several species, i.e., Idaho fescue, bluebunch wheatgrass, bitterbrush, and juniper may vary considerably depending on the locality, precipitation, and variations in soil characteristics.

Disturbance Response:

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

Inappropriate grazing causes a reduction in needle and thread (HECO26), indian ricegrass (ACHY), bluebunch wheatgrass (PSSP6), and other understory grass species. Idaho fescue (FEID) remains 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 (LiPU11) increases and grasses decline. Squirreltail (ELEL5) may increase initially as needle and thread and bluebunch wheatgrass decline, however with continued overgrazing this species will also decline. Eventually deep rooted perennial bunchgrasses (DRPBG) are eliminated. Cheatgrass becomes dominate along with rubber rabbitbrush (ERNAN5).

Cutting of juniper (JUOC) leads to an increase in grey rabbitbrush and cheatgrass with or without grazing. Idaho fescue is eliminated from areas where trees are removed due to harsh microclimate and cheatgrass replaces it. 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 extremely infrequent in the historical community and limited to single tree or small area events (Miller, R. pers. comm. 2006). 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. Fire would reduce the amount of sagebrush and bitterbrush while increasing cheatgrass and other annuals.

Ground fire potential increases with increasing cheatgrass, however fires would be infrequent and small in area.

State and transition model

Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
Grass/Grasslike					
1	Perennial, bunch-grass, deep-rooted			336-560	
	needle and thread	HECO26	<i>Hesperostipa comata</i>	336-560	–
2	Perennial, bunch-grass, deep-rooted			47-78	
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	47-78	–
3	Perennial, bunch-grass, deep-rooted			34-56	
	Thurber's needlegrass	ACTH7	<i>Achnatherum thurberianum</i>	34-56	–
4	Perennial, bunch-grass, deep-rooted			34-56	
	Idaho fescue	FEID	<i>Festuca idahoensis</i>	20-34	–

	bluebunch wheatgrass	PSSP6	<i>Pseudoroegneria spicata</i>	13-22	–
5	Perennial, bunch-grass, shallow-rooted			34-56	
	Sandberg bluegrass	POSE	<i>Poa secunda</i>	34-56	–
6	Other perennial grasses			7-34	
	Ross' sedge	CARO5	<i>Carex rossii</i>	0-11	–
	squirreltail	ELEL5	<i>Elymus elymoides</i>	0-11	–
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	0-11	–
	basin wildrye	LECI4	<i>Leymus cinereus</i>	0-11	–
Forb					
7	Perennial			54-90	
	common yarrow	ACMI2	<i>Achillea millefolium</i>	7-11	–
	pussytoes	ANTEN	<i>Antennaria</i>	7-11	–
	milkvetch	ASTRA	<i>Astragalus</i>	7-11	–
	hawksbeard	CREPI	<i>Crepis</i>	7-11	–
	fleabane	ERIGE2	<i>Erigeron</i>	7-11	–
	desertparsley	LOMAT	<i>Lomatium</i>	7-11	–
	lupine	LUPIN	<i>Lupinus</i>	7-11	–
	spreading phlox	PHDI3	<i>Phlox diffusa</i>	7-11	–
9	Other perennial forbs			13-22	
	agoseris	AGOSE	<i>Agoseris</i>	0-11	–
	woollypod milkvetch	ASPU9	<i>Astragalus purshii</i>	0-11	–
	Douglas' dustymaiden	CHDO	<i>Chaenactis douglasii</i>	0-11	–
	phacelia	PHACE	<i>Phacelia</i>	0-11	–
	deathcamas	ZIGAD	<i>Zigadenus</i>	0-11	–
Shrub/Vine					
11	Evergreen, dominant			20-34	
	basin big sagebrush	ARTRT	<i>Artemisia tridentata ssp. tridentata</i>	20-34	–
12	Evergreen, subdominant			13-22	
	slender buckwheat	ERMI4	<i>Eriogonum microthecum</i>	13-22	–
13	Deciduous, dominant			20-34	
	antelope bitterbrush	PUTR2	<i>Purshia tridentata</i>	20-34	–
15	Other shrubs			13-22	
	rubber rabbitbrush	ERNA10	<i>Ericameria nauseosa</i>	0-11	–
	granite prickly phlox	LIPU11	<i>Linanthus pungens</i>	0-11	–
	spineless horsebrush	TECA2	<i>Tetradymia canescens</i>	0-11	–
Tree					
16	Evergreen trees			34-56	
	western juniper	JUOC	<i>Juniperus occidentalis</i>	34-56	–

Animal community

This site is suitable to grazing by livestock. Mule deer, coyotes, and passerine birds may be found on this site.

Hydrological functions

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

Wood products

Firewood and posts.

Other information

Key species for cattle are needle and thread, indian ricegrass, Thurber needlegrass, Idaho fescue, and bluebunch wheatgrass. Species adapted to use in range seeding include crested wheatgrass, siberian wheatgrass, indian ricegrass, tall wheatgrass, secar bluebunch wheatgrass, and sheep fescue (in higher precipitation areas).

Other references

Site also associated with B10B Sites
Droughty South 9-12 PZ #010XB042OR
Droughty North 9-12 PZ #010XB084OR

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	State Rangeland Management Specialist for NRCS - Oregon
Date	04/24/2003
Approved by	
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 to some

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: Some to few

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): Slightly resistant to erosion: aggregate stability = 3-4

9. Soil surface structure and SOM content (include type of structure and A-horizon color and thickness): Weak very fine to fine granular structure, dry color value 5-6, 8 to 10 inches thick; low OM (1-2%)

10. Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff: Significant ground cover (55-65%) and level to moderately steep slopes 0-30%) moderately 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 > perennial forbs

Sub-dominant: Evergreen shrubs >= deciduous shrubs

Other: Evergreen trees

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: 1000, Normal: 800, Unfavorable: 600 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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