USDA Natural Resources
Conservation Service

Ecological site R023XY211OR
PUMICE CLAYPAN 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.

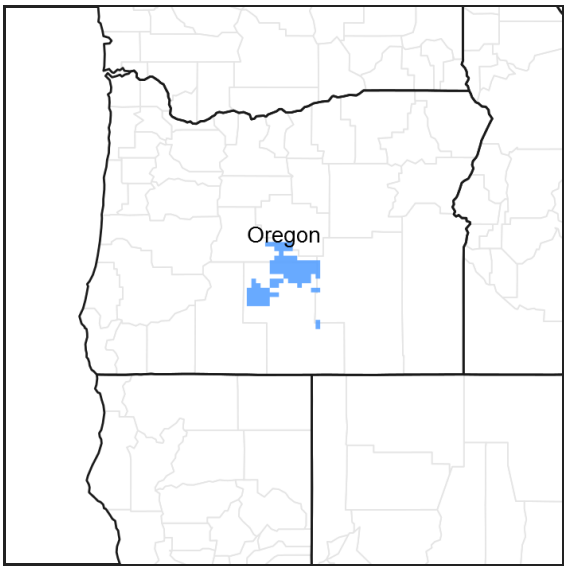

Figure 1. Mapped extent

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

R023XY221OR	**GRAVELLY TERRACE 10-12 PZ** Gravelly Terrace 10-12" PZ
R023XY508OR	**PUMICE FLAT 10-12 PZ** Pumice Flat 10-12" PZ
R023XY514OR	**PUMICE 8-10 PZ** Pumice 8-10" PZ

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Artemisia arbuscula*
Herbaceous	(1) *Festuca idahoensis* (2) *Achnatherum thurberianum*

Physiographic features

This site is typically nearly level and occurs on broad flats or old lake terraces within large basins. Slopes range from 0 to 10 percent. Elevations range from 4100 to 5000 feet.

Table 2. Representative physiographic features

Landforms	(1) Lake terrace (2) Basin floor (3) Flat
Elevation	1,250–1,524 m
Slope	0–10%
Water table depth	152 cm
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 November and June, mostly in the form of snow and spring-fall rains. The soil temperature regime is frigid and the site is located in an area of cold air drainage. The average annual air temperature is 43 degrees F with extreme temperatures ranging from -30 to 103 degrees F. The frost free period is 50 to 90 days. The optimum period for plant growth is from mid-April through mid-June.

Table 3. Representative climatic features

Frost-free period (average)	90 days
Freeze-free period (average)	0 days
Precipitation total (average)	305 mm

Influencing water features

Soil features

The soils of this site have sandy loam surface layers and clayey subsoils. They are shallow over basalt bedrock and well-drained. They are generally formed in residuum or colluvium, and contain volcanic ash on the surface. Permeability is slow and the available water holding capacity (AWC) is 2.5 to 5.5 inches for the profile. The potential for water erosion is low and for wind erosion is high.

Table 4. Representative soil features

Parent material	(1) Basaltic volcanic ash–basalt (2) Residuum–basalt
Surface texture	(1) Ashy sandy loam
Family particle size	(1) Clayey
Drainage class	Well drained
Permeability class	Slow to moderately slow
Soil depth	25–51 cm
Surface fragment cover <=3"	0–15%
Surface fragment cover >3"	0–10%
Available water capacity (0-101.6cm)	6.35–13.97 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)	6.6–7.8
Subsurface fragment volume <=3" (Depth not specified)	4–15%
Subsurface fragment volume >3" (Depth not specified)	1–3%

Ecological dynamics

Range in Characteristics:
The reference native plant community is dominated by Idaho fescue (50%) and Low sagebrush (10%). Thurber needlegrass is prominent in the stand making up about 10 percent. Forbs are minor and make up about 5 percent of the composition. Vegetative composition is about 85 percent grasses, 3 percent forbs, and 12 percent shrubs.

Low sagebrush may be less abundant when the claypan is deeper than normal.

Four states have been identified for this site: a reference state; a state with the presence of annuals; a state that has Juniper and Low sagebrush co-dominant on the site, and a state with annual dominance.

Reference State: Stable plant community affected infrequently by fire. Sites are dominated with low sagebrush with some sites exhibiting a small percentage of old growth juniper. Infrequent fire (> 80 to 100 year intervals) maintained site dynamics. Fire reduced shrub cover in a mosaic, patchy pattern. The introduction of invasive annual grasses and forbs transitions into state 2.

State 2: Compositionally similar to the reference state with a trace of cheatgrass and/or medusahead and other annual weeds. Ecological function has not changed, however the resiliency of the state has been reduced by the presence of invasive weeds. Infrequent fire (> 80 to 100 years) reduces shrub cover, removes young juniper and promotes grass production while time since fire allows shrub recovery. Mismanagement of grazing facilitates an increase in Sandberg’s bluegrass, weedy species, young juniper and low sagebrush. Bunchgrasses decline in production and density. Prescribed grazing can reverse the trend. Los of deep-rooted perennial bunchgrasses and an increase in young Juniper brings the site to State 3.

State 3: Low sagebrush and possibly young juniper dominated with minimal perennial, deep-rooted grasses. Cheatgrass and/or medusahead along with other weedy forbs are increased in density and cover. Sandberg’s bluegrass cover and vigor declining. Water flow paths evident. Sagebrush and possibly juniper control site resources. Catastrophic wildfire leading to annual dominated plant community will take the site to State 4.

State 4: Cheatgrass and/or medusahead dominated. Few old growth juniper may be present. Rabbitbrush increased with few to no low sagebrush. Wind and water erosion drive site processes.

Response to Disturbance:
Burning will reduce the cover of low sagebrush, encourage rabbitbrush, and may temporarily lower the proportion of Idaho fescue in the stand. Composition changes resulting from overgrazing are generally a decline in Idaho fescue, and an increase in needlegrass and/or thickspike wheatgrass. Excessive winter use may cause a decline in low sagebrush.

State and transition model

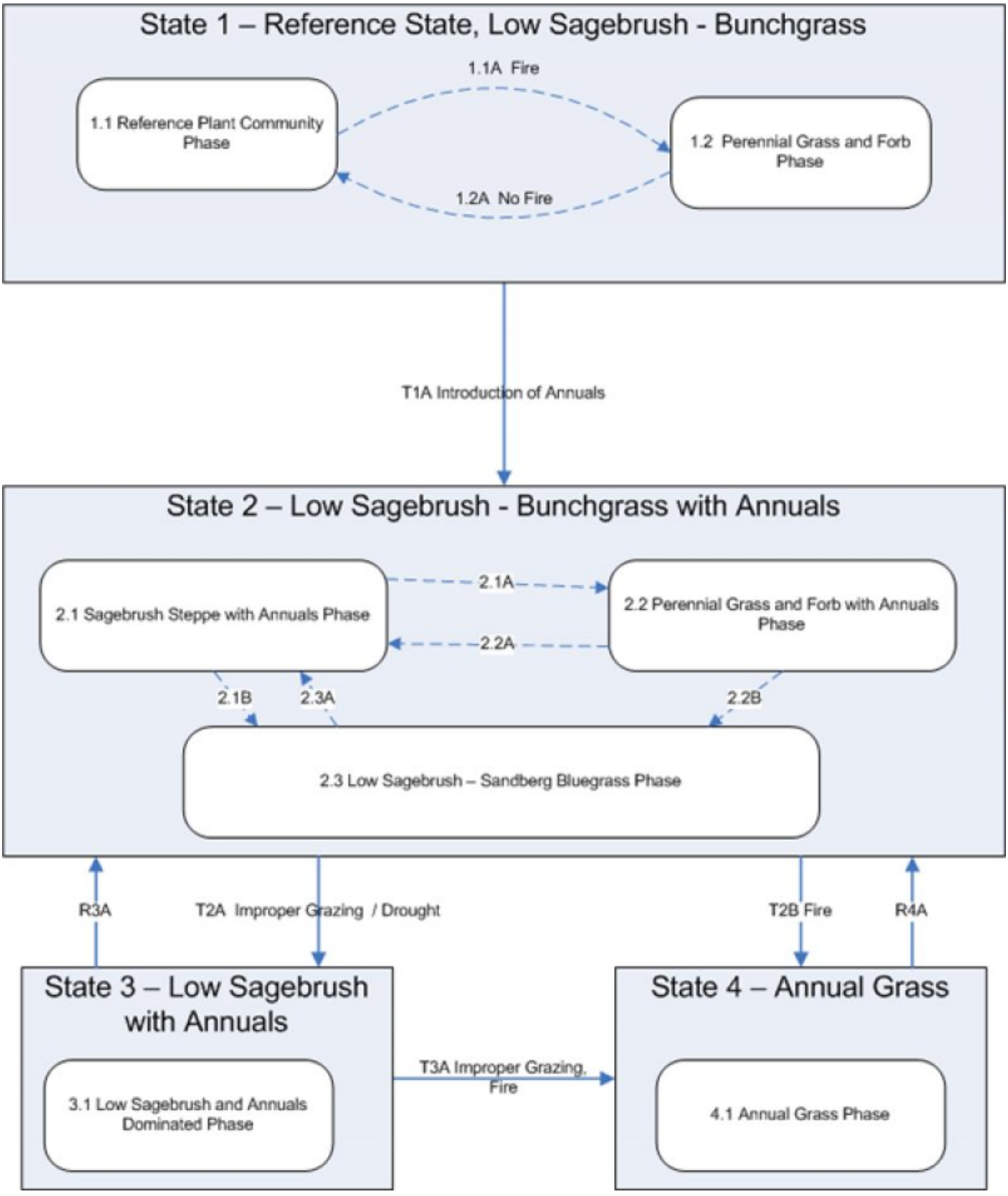

Figure 3. Group 10, STM

State 1
Reference State

Community 1.1
Reference Plant Community

The potential native plant community is dominated by Idaho fescue (60 percent) and low sagebrush and/or early

sagebrush (10 percent). Thurber needlegrass is prominent in the stand, making up about 10 percent. Forbs are minor and make up about 5 percent of the composition. Total foliar cover is about 50 percent, of which 10 percent is shrub cover, and 40 percent is grass/forb cover.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	286	381	476
Shrub/Vine	40	54	67
Forb	10	13	17
Total	**336**	**448**	**560**

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, deep-rooted, bunchgrass**			179–269	
	Idaho fescue	FEID	*Festuca idahoensis*	179–269	–
2	**Perennial, deep-rooted, bunchgrass**			56–112	
	Thurber's needlegrass	ACTH7	*Achnatherum thurberianum*	22–45	–
	western needlegrass	ACOC3	*Achnatherum occidentale*	17–28	–
	bluebunch wheatgrass	PSSP6	*Pseudoroegneria spicata*	4–13	–
	thickspike wheatgrass	ELLAL	*Elymus lanceolatus ssp. lanceolatus*	6–11	–
	prairie Junegrass	KOMA	*Koeleria macrantha*	2–6	–
4	**Perennial, shallow-rooted, bunchgrass**			0–4	
	Sandberg bluegrass	POSE	*Poa secunda*	0–4	–
5	**Perennial, other**			4–9	
	Ross' sedge	CARO5	*Carex rossii*	0–4	–
	squirreltail	ELEL5	*Elymus elymoides*	0–4	–
Forb					
5	**Other perennial forbs, all**			4–22	
	pussytoes	ANTEN	*Antennaria*	0–4	–
	woodypod milkvetch	ASSC6	*Astragalus sclerocarpus*	0–4	–
	milkvetch	ASTRA	*Astragalus*	0–4	–
	Douglas' dustymaiden	CHDO	*Chaenactis douglasii*	0–4	–
	giant blue eyed Mary	COGR2	*Collinsia grandiflora*	0–4	–
	buckwheat	ERIOG	*Eriogonum*	0–4	–
	snow buckwheat	ERNI2	*Eriogonum niveum*	0–4	–
	lupine	LUPIN	*Lupinus*	0–4	–
	phlox	PHLOX	*Phlox*	0–4	–
Shrub/Vine					
11	**Low growing**			22–67	
	little sagebrush	ARAR8	*Artemisia arbuscula*	0–67	–
	little sagebrush	ARARL	*Artemisia arbuscula ssp. longiloba*	0–67	–
12	**Perennial, evergreen, sub-dominant**			13–27	
	yellow rabbitbrush	CHVI8	*Chrysothamnus viscidiflorus*	4–9	–
	slender buckwheat	ERMI4	*Eriogonum microthecum*	4–9	–
	rubber rabbitbrush	ERNA10	*Ericameria nauseosa*	4–9	–
13	**Perennial, deciduous**			0–9	
	antelope bitterbrush	PUTR2	*Purshia tridentata*	0–9	–
Tree					
15	**Evergreen Trees**			0–9	
	western juniper	JUOC	*Juniperus occidentalis*	0–9	–

Animal community

Livestock Grazing:

Water is usually not available on-site. Winter grazing is possible in mild winters with little snow, but protection from the cold for livestock is absent due to lack of tall cover.

Native Wildlife Associated with the Potential Climax Community:

Rabbits
Rodents
Mule deer
Sage grouse
Pronghorn antelope

Pronghorn use this site as winter range.

Hydrological functions

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

Other information

Adapted species for seedings include crested wheatgrass, Siberian wheatgrass, sheep fescue, and thickspike wheatgrass. Due to shallow soils, this site has low potential for seeding.

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 Frannsen
Contact for lead author	State Rangeland Management Specialist for NRCS - OR
Date	08/15/2012
Approved by	Bob Gillaspy
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** None, slight sheet & rill erosion hazard

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

3. **Number and height of erosional pedestals or terracettes:** None to very few pedestals

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 10-35%

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

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

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 = 1-3

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Shallow well drained sandy loam: Low OM (1-3%)

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Moderate ground cover (50%) and gentle slopes (0-10%) 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: Idaho fescue > Low sagebrush > Thurber needlegrass > other grasses > forbs > other shrubs

    Sub-dominant:

    Other:

    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):**

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** Favorable: 500, Normal: 400, Unfavorable: 300 lbs/acre/year at high RSI (HCPC)

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.

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