USDA Natural Resources Conservation Service

Ecological site R023XY217OR
JUNIPER TABLELAND 12-16 PZ

Accessed: 05/11/2025

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.

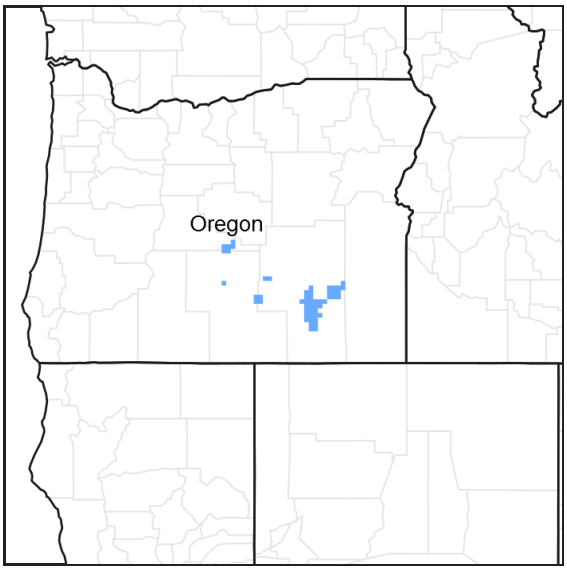

Figure 1. Mapped extent

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

R023XY216OR	**CLAYPAN 12-16 PZ** Claypan 12-16" PZ
R023XY318OR	**LOAMY 12-16 PZ** Loamy 12-16" PZ

Similar sites

R023XY218OR	**THIN SURFACE CLAYPAN 10-16 PZ** Thin Surface Claypan 10-16" PZ (shallow surface)
R023XY216OR	**CLAYPAN 12-16 PZ** Claypan 12-16" PZ (less rock fragments)
R023XY214OR	**CLAYPAN 10-12 PZ** Claypan 10-12" PZ (lower precipitation)

Table 1. Dominant plant species

Tree	(1) *Juniperus occidentalis*
Shrub	(1) *Artemisia arbuscula*

Herbaceous	(1) *Festuca idahoensis* (2) *Pseudoroegneria spicata ssp. spicata*

Physiographic features

This site occurs on hills, ridges, and tablelands. Slopes range from 2 to 30 percent. Elevations range from 4000 to 6000 feet.

Table 2. Representative physiographic features

Landforms	(1) Hill (2) Ridge
Elevation	4,000–6,000 ft
Slope	2–30%
Water table depth	10–20 in

Climatic features

The annual precipitation ranges from 12 to 16 inches. Most of which occurs as snow during the months of December through February. Spring rains are common. The soil temperature regime is frigid. Mean annual air temperature is 40 to 45 degrees F. The average frost-free period ranges from 50 to 80 days. The optimum growth period for native plants is from mid-May to mid-July.

Table 3. Representative climatic features

Frost-free period (average)	80 days
Freeze-free period (average)	0 days
Precipitation total (average)	16 in

Influencing water features

Soil features

The soils of this site are shallow and well-drained. Depth to bedrock is between 10 to 20 inches. Typically the surface textures are extremely stony silt loams with the surface layer being 0 to 4 inches thick. The subsurface textures range from gravelly clays to cobbly clays with depths ranging from 4 to 16 inches. Rock fragment content in the subsoil ranges from 10 to 35 percent. Percent clay content is 35 to 60 percent. Permeability is slow. The available water holding capacity is about 2 inches for the profile. The potential for wind and water erosion is slight. The shrink-swell potential is high.

Table 4. Representative soil features

Surface texture	(1) Very stony sandy loam (2) Gravelly
Family particle size	(1) Clayey
Drainage class	Well drained
Permeability class	Slow
Soil depth	4–20 in
Available water capacity (0-40in)	2 in
Subsurface fragment volume <=3" (Depth not specified)	10–35%

Subsurface fragment volume >3" (Depth not specified)	10–35%

Ecological dynamics

Range in Characteristics:
The reference native plant community is dominated by Idaho fescue, Bluebunch wheatgrass, Low sagebrush, and Western Juniper. Thurber needlegrass and Sandberg bluegrass is prominent. Other grasses, shrubs, and forbs are minor components. The vegetative composition of the community by air-dry weight to 4.5 feet is approximately 55 percent grasses, 10 percent forbs, and 35 percent shrubs and trees (5 mature trees over 120 years per acre).

Thurber needlegrass increases with gravelly textured soil surfaces. Bluebunch wheatgrass increases at lower elevation, lower precipitation ranges, and on southerly aspects.

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: 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 the 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:
As the site deteriorates, low sagebrush and Sandberg bluegrass increase in plant density, while Idaho fescue and bluebunch wheatgrass decrease.

State and transition model

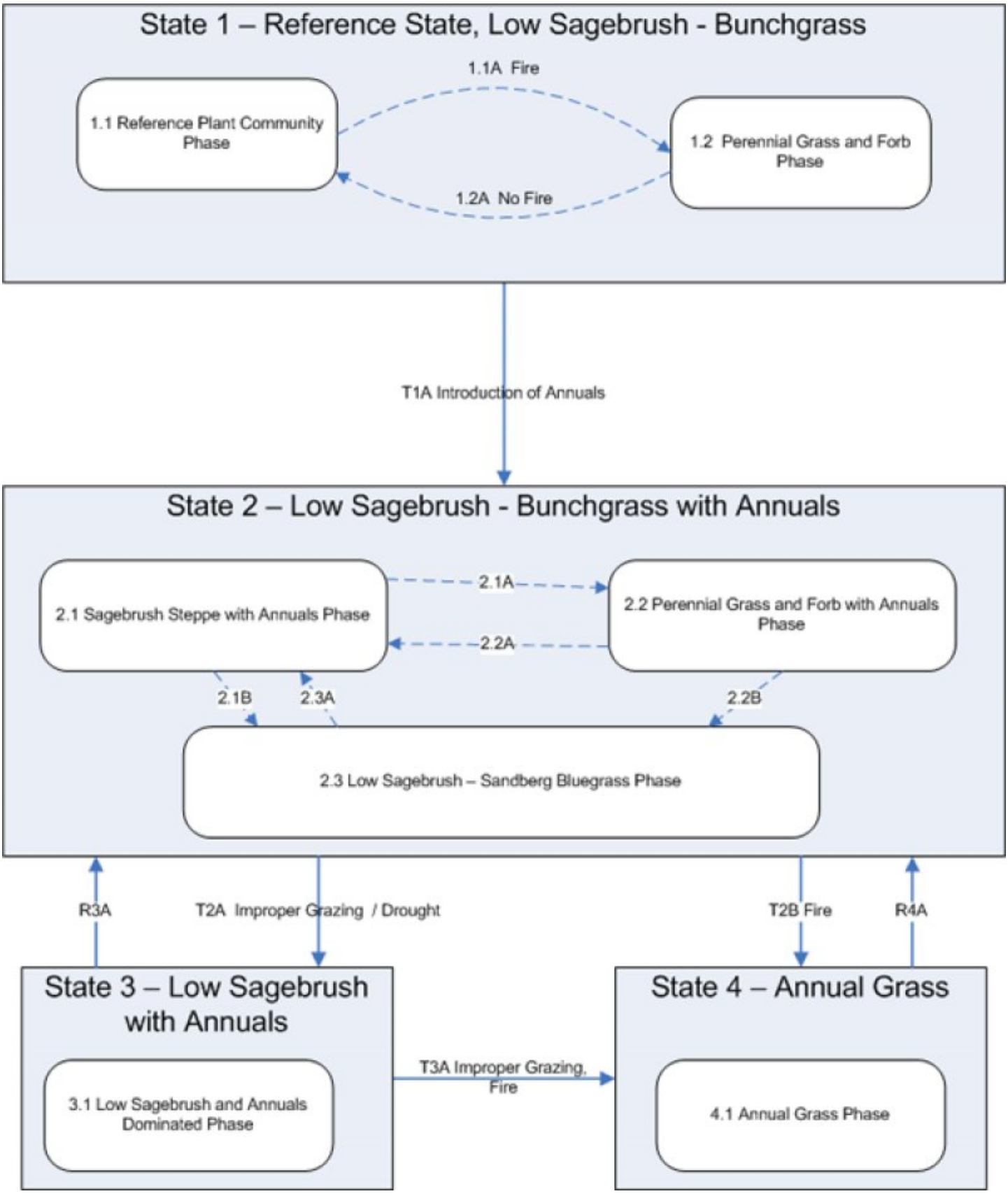

Figure 2. Group 10, STM

State 1
Historic Climax Plant Community

Community 1.1
Historic Climax Plant Community

The potential native plant community is dominated by Idaho fescue, bluebunch wheatgrass, low sagebrush, and

western juniper. Thurber needlegrass and Sandberg bluegrass are prominent. Other grasses, shrubs, and forbs are minor components. The vegetative composition of the community by air-dry weight to 4.5 feet is approximately 70 percent grasses, 10 percent forbs, and 20 percent shrubs and trees. Approximate ground cover is 35-45 percent (basal and crown).

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	427	581	735
Shrub/Vine	49	95	140
Tree	35	70	105
Forb	21	56	91
Total	**532**	**802**	**1071**

Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	**Perennial, deep-rooted, dominant**			350–490	
	Idaho fescue	FEID	*Festuca idahoensis*	245–315	–
	bluebunch wheatgrass	PSSP6	*Pseudoroegneria spicata*	105–175	–
2	**Perennial, deep-rooted, sub-dominant**			35–105	
	Thurber's needlegrass	ACTH7	*Achnatherum thurberianum*	35–105	–
4	**Perennial, shallow-rooted, sub-dominant**			35–105	
	Sandberg bluegrass	POSE	*Poa secunda*	35–105	–
5	**Other perennial grasses, all**			7–35	
	squirreltail	ELEL5	*Elymus elymoides*	0–9	–
	prairie Junegrass	KOMA	*Koeleria macrantha*	0–9	–
	bluegrass	POA	*Poa*	0–9	–
	Cusick's bluegrass	POCU3	*Poa cusickii*	0–9	–
Forb					
7	**Perennial, all, dominant**			7–21	
	phlox	PHLOX	*Phlox*	7–21	–
9	**Other perennial forbs, all**			14–70	
	common yarrow	ACMI2	*Achillea millefolium*	0–5	–
	agoseris	AGOSE	*Agoseris*	0–5	–
	pussytoes	ANTEN	*Antennaria*	0–5	–
	balsamroot	BALSA	*Balsamorhiza*	0–5	–
	Douglas' dustymaiden	CHDO	*Chaenactis douglasii*	0–5	–
	larkspur	DELPH	*Delphinium*	0–5	–
	buckwheat	ERIOG	*Eriogonum*	0–5	–
	common starlily	LEMO4	*Leucocrinum montanum*	0–5	–
	desertparsley	LOMAT	*Lomatium*	0–5	–
	lupine	LUPIN	*Lupinus*	0–5	–
	beardtongue	PENST	*Penstemon*	0–5	–
	phacelia	PHACE	*Phacelia*	0–5	–
	largehead clover	TRMA3	*Trifolium macrocephalum*	0–5	–
Shrub/Vine					
11	**Perennial, evergreen, dominant**			35–105	
	little sagebrush	ARAR8	*Artemisia arbuscula*	35–105	–
15	**Other perennial shrubs, all**			14–35	
	yellow rabbitbrush	CHVI8	*Chrysothamnus viscidiflorus*	0–18	–
	antelope bitterbrush	PUTR2	*Purshia tridentata*	0–18	–
Tree					
16	**Perennial, evergreen, dominant**			35–105	
	western juniper	JUOC	*Juniperus occidentalis*	35–105	–

Animal community

Livestock Grazing:

This site is moderately suitable for cattle, horse, and sheep use in late spring, summer, and fall under a planned grazing system. Rock fragments on the soil surface inhibit movement by livestock. Deferred grazing is recommended in at least one in three years. Grazing should be delayed until the soil is dry enough so that damage to plant roots and crowns is avoided.

Native Wildlife Associated with the Potential Climax Community:

Mule deer
Pronghorn antelope
Sage grouse
Quail

During spring, mule deer will feed in the area if adequate escape cover is nearby.

Hydrological functions

The soils of this site have slow infiltration rates and slow to rapid runoff potential. The hydrologic soil group is D.

Wood products

The site has the potential for producing fence posts, firewood, and other specialty products.

Other information

Suitability for seeding is very poor because of the surface rock fragments. Bedrock restricts rooting depth and limits construction of water impoundments. Shallow soil depths limit placements of fence posts and make special design of fences necessary. The soil expands when wet and contracts when dry, which may damage structures and fences.

Contributors

Bob Gillaspy
Gene Hickman, NRCS - Bend, OR
M. Parks (OSU)

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	08/16/2012
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 to very few pedestals

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 10-20%

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

6. **Extent of wind scoured, blowouts and/or depositional areas:** None, Slight 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):** 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):** Shallow well drained extremely stony silt loams (0-4 inches thick) with subsoil having high shrink-swell potential: Moderate OM (2-4%)

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Low to moderate ground cover (35-45%) and gentle to moderate slopes (2-30%) 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: Idaho fescue > Bluebunch wheatgrass > other grasses > shrubs > forbs > trees

    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: 900, Normal: 700, Unfavorable: 500 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