USDA Natural Resources
Conservation Service

Ecological site R010XY113OR
Swale 9-12 PZ

Accessed: 05/12/2025

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.

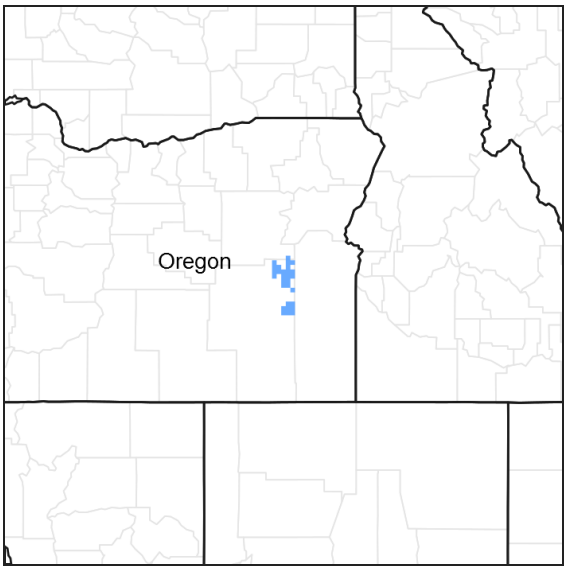


Figure 1. Mapped extent

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.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Artemisia tridentata ssp. tridentata*
Herbaceous	(1) *Leymus cinereus* (2) *Pseudoroegneria spicata ssp. spicata*

Physiographic features

This site occurs adjacent to and on the floodplains of ephemeral streams. It is at the upper end of drainages occupying broad to narrow swale areas. Slopes range from 2 to 12 percent. Elevations range from 2000 to 3600 feet.

Table 2. Representative physiographic features

Landforms	(1) Flood plain (2) Stream (3) Swale
Flooding frequency	None
Ponding frequency	None

Elevation	610–1,097 m
Slope	2–12%
Water table depth	152 cm
Aspect	Aspect is not a significant factor

Climatic features

The annual precipitation ranges from 9 to 12 inches, most of which occurs in the form of snow during the months of November through March. An ephemeral supply of subsurface moisture augments the precipitation. Localized convection storms occasionally occur during the summer. The soil temperature regime is mesic with a mean annual air temperature of 52 degrees F. Temperature extremes range form 100 to -10 degrees F. The frost-free period ranges from 110 to 140 days. The optimum growth period for native plants is from April through July.

Table 3. Representative climatic features

Frost-free period (average)	140 days
Freeze-free period (average)	0 days
Precipitation total (average)	305 mm

Influencing water features

Soil features

The soils of this site are recent, deep to very deep and well-drained. Typically the surface layer is a silt loam about 10 inches thick. The subsoil is a silt loam to silty clay loam over 40 inches thick. The substratum varies from alluvium to bedrock. Permeability is moderate. The available water holding capacity (AWC)is about 8 to 10 inches for the profile. Seasonal subsurface flows from adjacent slopes augment the available water. The potential for erosion is moderate.

Table 4. Representative soil features

Surface texture	(1) Silt loam
Family particle size	(1) Clayey
Drainage class	Somewhat poorly drained to well drained
Permeability class	Moderate
Soil depth	127 cm
Available water capacity (0-101.6cm)	20.32–25.4 cm

Ecological dynamics

Range in Characteristics:

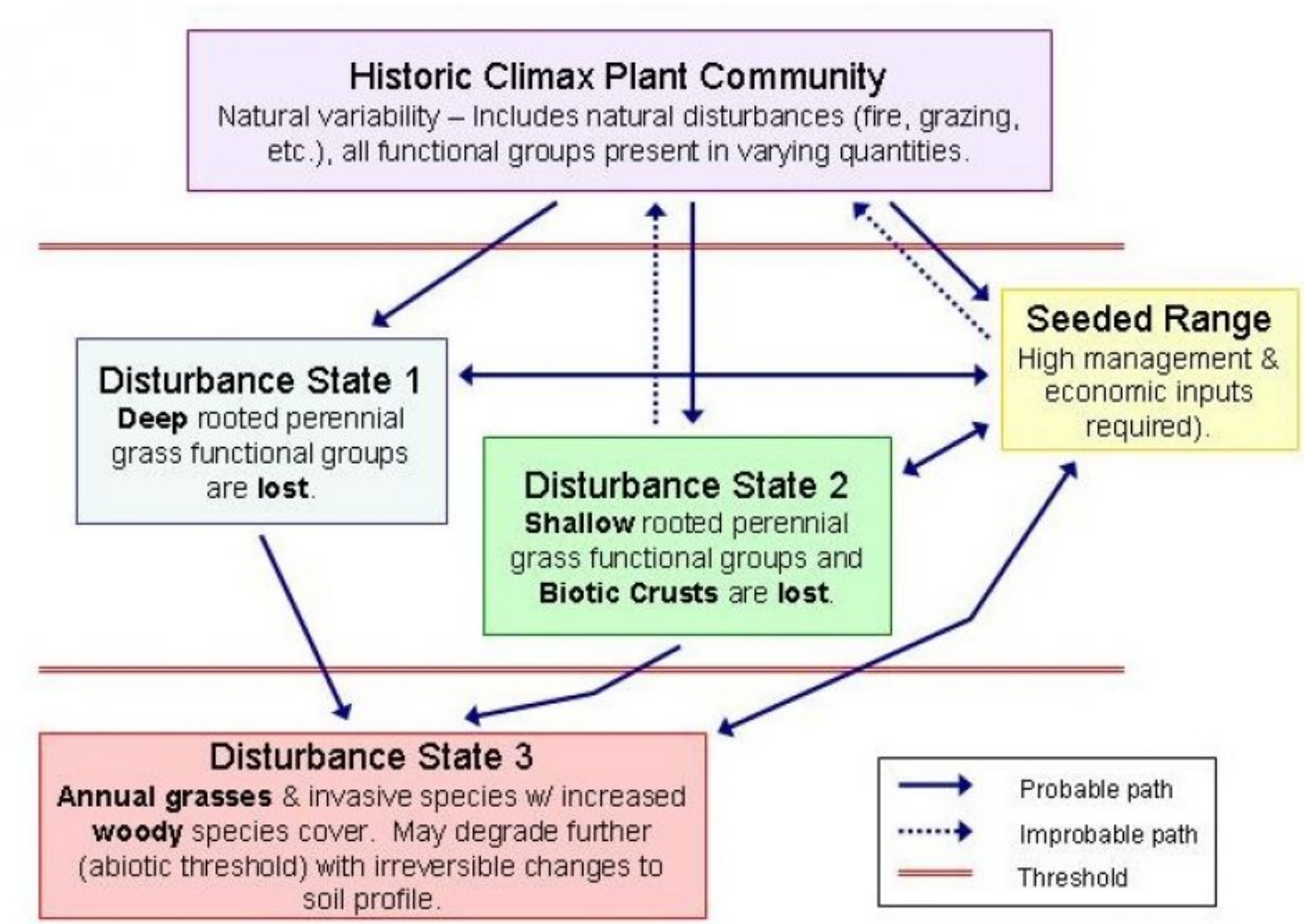
Basin wildrye dominates the stand in areas with a good supply of subsurface flows. Basin wildrye decreases and bunchgrasses increase on upper ends of watersheds where drainage area is limited. Production follows a similar pattern, increasing on swales with large drainage areas. Coarse surface textures favor needle-and-thread over bluebunch wheatgrass. As a site susceptible to fire, the amount of basin big sagebrush is influenced by fire frequency.

Response to Disturbance:

If the condition of the site deteriorates as a result of overgrazing, basin wildrye decreases and bluebunch wheatgrass and needle-and-thread increase. With further deterioration, basin big sagebrush and Sandberg

bluegrass increase. Annuals invade and useable forage production decreases. Streambanks become unstable from loss of vegetation and channels degrade, becoming deeper and wider in the process. Subsurface flows are affected. Peak discharges increase, the water table drops and storage of water for late season use is reduced. Plants well adapted to a drier climatic regime increase or invade and production drops.

State and transition model



GENERAL MODEL FOR COOL-SEASON BUNCHGRASS RANGELANDS

State 1
Reference Plant Community

Community 1.1
Reference Plant Community

The potential native plant community is dominated by basin wildrye and bluebunch wheatgrass. Basin big sagebrush and needle-and-thread are common. Sandberg bluegrass, western wheatgrass, and a variety of forbs are present. Vegetative composition of the community is approximately 85 percent grasses, 5 percent forbs, and 10 percent shrubs. Approximate ground cover is 80-90 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	2158	2858	3559
Shrub/Vine	112	211	308
Forb	84	155	224
Total	**2354**	**3224**	**4091**

Figure 4. Plant community growth curve (percent production by month). OR4451, B10 SR Fan and Swale, 9-16 pz . SR Fan and Swale, 9-16 pz RPC Growth Curve.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	5	10	25	25	20	5	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 (%)
Grass/Grasslike					
1	**Perennial, deep-rooted, dominant**			1681–2522	
	bluebunch wheatgrass	PSSP6	*Pseudoroegneria spicata*	841–1401	–
	basin wildrye	LECI4	*Leymus cinereus*	841–1121	–
2	**Perennial, deep-rooted, sub-dominant**			364–701	
	needle and thread	HECO26	*Hesperostipa comata*	280–560	–
	Idaho fescue	FEID	*Festuca idahoensis*	84–140	–
4	**Perennial, shallow-rooted, sub-dominant**			56–112	
	prairie Junegrass	KOMA	*Koeleria macrantha*	28–56	–
	Sandberg bluegrass	POSE	*Poa secunda*	28–56	–
5	**Other perennial grasses, all**			56–224	
	western needlegrass	ACOC3	*Achnatherum occidentale*	0–75	–
	squirreltail	ELEL5	*Elymus elymoides*	0–75	–
	bluegrass	POA	*Poa*	0–75	–
Forb					
7	**Perennial, all, dominant**			56–112	
	milkvetch	ASTRA	*Astragalus*	28–56	–
	lupine	LUPIN	*Lupinus*	28–56	–
9	**Other perennial forbs, all**			28–112	
	common yarrow	ACMI2	*Achillea millefolium*	0–28	–
	white sagebrush	ARLU	*Artemisia ludoviciana*	0–28	–
	arrowleaf balsamroot	BASA3	*Balsamorhiza sagittata*	0–28	–
	tapertip hawksbeard	CRAC2	*Crepis acuminata*	0–28	–
	fleabane	ERIGE2	*Erigeron*	0–28	–
	buckwheat	ERIOG	*Eriogonum*	0–28	–
	desertparsley	LOMAT	*Lomatium*	0–28	–
	phlox	PHLOX	*Phlox*	0–28	–
Shrub/Vine					
11	**Perennial, evergreen, dominant**			56–140	
	basin big sagebrush	ARTRT	*Artemisia tridentata ssp. tridentata*	56–140	–
12	**Perennial, evergreen, sub-dominant**			28–84	
	rabbitbrush	CHRYS9	*Chrysothamnus*	28–84	–
15	**Other perennial shrubs, all**			28–84	
	horsebrush	TETRA3	*Tetradymia*	28–84	–

Animal community

Livestock Grazing:

This site is suited to use by cattle, sheep, and horses in all seasons under a planned grazing system. Limitations in the spring are saturated wet soils and unstable banks. Use should be postponed until the soils are firm enough to prevent trampling damage and soil compaction, yet while soil moisture is adequate to allow the completion of the plant growth cycle. Improvement and/or maintenance of herbaceous bank protection should be considered during all seasons, particularly going into the winter, for spring high flow periods.

Hydrological functions

The soils are in hydrologic group B. The soils of this site have moderately low runoff potential. This site is potentially subject to three high flow periods: low elevation snowmelt, high elevation snowmelt, and summer cloudburst flow.

Other information

The soils of this site have excellent water holding capacities providing late season water for plant growth and slow water release to streams. When incised channels are present, rehabilitation will markedly improve production and restore good hydrologic characteristics. On altered sites the reintroduction of desirable deep rooted plants may be needed to fully restore the site productivity.

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)	
Contact for lead author	
Date	
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:**

2. **Presence of water flow patterns:**

3. **Number and height of erosional pedestals or terracettes:**

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

5. **Number of gullies and erosion associated with gullies:**

6. **Extent of wind scoured, blowouts and/or depositional areas:**

7. **Amount of litter movement (describe size and distance expected to travel):**

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):**

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):**

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):**

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:

    Sub-dominant:

    Other:

    Additional:

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

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):**

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:

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17. **Perennial plant reproductive capability:**
